Collaboration between startups and incumbent companies in the field of consumer cleantech

A perspective of transition studies

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Abstract

Companies play a crucial role in transitions to more sustainable ways of production and consumption. There is a growing amount of startups globally that create radically new products, services, and business models related to issues such as energy efficiency, food waste or use of natural resources. Startups can be conceptualized as niche actors who are innovative and agile but do not have the resources for regime disruption. Incumbents on traditional fields such as construction, real estate or retail, on the other hand, tend to be path dependent, work under the rules of current regimes, and face difficulties in adopting sustainability-related innovations. However, when combining the innovation capacity of niche startups and the resources of large companies, both can achieve a larger impact.

This thesis observes collaboration between startups and large companies through the framework of strategic niche management (SNM). According to SNM niche innovations can be empowered by three processes: articulation of expectations, network-building and learning on various dimensions. A multiple-case study is conducted based on interviews and observation with three large companies and three startups engaging in experimental collaboration processes facilitated by an intermediary organization. The large companies are in the field of retail and hospitality, housing development and facility management. The startups develop radically new services that reduce food waste, save energy or optimize the use of buildings.

The findings of the descriptive case study depict challenges and opportunities of collaboration processes in all SNM dimensions. Theoretically, the study suggests one way of applying transition theory to the level of specific companies and their collaboration related to sustainability-related innovations. From a managerial perspective, the study offers practical insight to anyone engaging in startup–incumbent collaboration. As broad generalizations cannot be derived from a case study, more research on the role of companies in sustainability transitions is suggested.

Keywords
strategic niche management, strategic collaboration, startups, consumer cleantech

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Tiivistelmä

Yritysten rooli on merkittävä murroksessa kohti kestävämpiä kulutuksen ja tuotannon tapoja. Yhä useammat startup-yritykset kehittävät radikaalisti uudenlaisia tuotteita, palveluja sekä liiketoimintamalleja esimerkiksi energiatehokkuuteen, ruokahävikkiin tai luonnonvarojen käytön vähentämiseen. Startupit voidaan nähdä niche-tason toimijoina, jotka ovat innovatiivisia ja ketteriä, mutta joilla ei ole resursseja murtaa vallitsevia rakenteita ja toimintamalleja. Suuret, vakiintuneet yritykset perinteisillä aloilla, kuten rakentaminen, kiinteistöhuolto sekä päivittäistavarakauppa, taas ovat usein polkuriippuvaisia ja toimivat hallitsevien rakenteiden ehdoilla. Näiden yritysten voi olla vaikea ottaa käyttöön uudenlaisia, kestäviä innovaatioita. Startup-yritysten innovaatiokyvyn sekä suurten yritysten resurssit yhdistämällä voidaan kuitenkin saada aikaan suurempi muutos.

Tämä tutkielma tarkastelee startup-yritysten ja suurten yritysten yhteistyötä innovaatiopolkujen strategisen edistämisen (strategic niche management, SNM) viitekehyksen kautta. Viitekehyksen mukaan niche-innovaatioita voidaan vahvistaa kolmen prosessin kautta: odotusten artikuloinnin, verkostojen luomisen sekä useamman tason oppimisen. Tutkimuksen menetelmänä on monitapaustutkimus, joka pohjautuu haastatteluihin ja havainnointiin kolmen yhteistyötä tekevän startupin ja kolmen suuren yrityksen välisistä fasilitoiduista yhteistyöprosesseista. Tutkimuksen suuret yrityksen ovat vähittäiskaupan ja ravintoloiden, asuinaluekehityksen sekä kiinteistöhuollon aloilta. Tutkitut startup-yritykset kehittävät uudenlaisia ratkaisuja ruokahävikin vähentämiseen, energiansäästöön ja rakennusten käyttöasteen tehostamiseen.

Kuvailevan tapaustutkimuksen tulokset kuvaavat yhteistyöprosessien haasteita ja mahdollisuuksia innovaatiopolkujen strategisen edistämisen osa-alueiden kautta. Teoreettisesti tutkimus esittelee tavan soveltaa transitioteoriaa yksittäisten yritysten ja kestäviin innovaatioihin liittyvien yhteistyöprosessien tasolla. Liikkeenjohdollisesta näkökulmasta tutkielma tarjoaa konkreettisia oppeja yhteistyöprosesseista kiinnostuneille yrityksille. Tapaustutkimus menetelmänä ei tarjoa mahdollisuuksia tulosten yleistämiseen, joten laajempaa tutkimusta yritysten roolista kestävyysmuutoksessa tarvitaan.

Avainsanat
innovaatiopolkujen strateginen edistäminen, strateginen yhteistyö, startupit, kuluttajacleantech

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1 Introduction

Companies play a crucial role in transitions to more sustainable ways of production and consumption (Geels et al., 2017). There is a growing amount of startups globally that create radically new products, services and business models related to issues such as energy-efficiency, food waste or use of natural resources. At the same time incumbent companies are increasingly pressured by landscape-level developments such as digitalization and a growing pressure to adopt more sustainable business models and practices (Ritola et al., 2015). However, both big and small companies face challenges when creating or engaging in new, sustainable business (Hockerts and Wüstenhagen, 2010). Small companies and startups often lack the resources or knowhow to scale their business (Antikainen et al., 2016). Incumbents, on the other hand, are often better at creating incremental process innovations than disruptive, new business. However, through strategic alliances startups and incumbent companies might be able to complement each other's skills and resources in a way that benefits both (Rothaermel, 2001). In an ideal situation a startup's sustainable solution could scale up faster, an incumbent company would find business opportunities in new areas, and both would contribute to a bigger impact on the society. This qualitative research seeks to provide insight on collaboration between disruptive startups and incumbents in traditional fields and analyze challenges and opportunities in the collaboration processes.

Theoretically, the study observes collaboration processes through the lens of transition studies. The growing stream of literature examines long-term, multi-dimensional processes through which established socio-technical systems shift to more sustainable ways of production and consumption (Markard et al., 2012). The approach of strategic niche management (SNM) stems from the observation that radical niche innovations often fail to become commercially successful because of path dependencies of current regimes. SNM research has identified three processes through which niche innovations may develop successfully: articulation of expectations, building of networks and learning in various dimensions (Raven, 2005).

In transition studies incumbent companies in traditional fields such as construction or food distribution are assumed to operate largely within the structures of existing regimes, whereas startups often work on radical innovations which do not quite fit the existing regimes (Geels, 2011). The need for interaction and collaboration between these levels has been claimed to

be a key for accelerating sustainability transitions (ibid.). However, firm-level strategies and roles of individual actors have scarcely been discussed in transitions and SNM literature. Therefore, the perspective of startups and incumbent companies are sought from the literature on sustainable entrepreneurship and strategic alliances. These fields of research provide answers to questions such as what are the motives and capabilities of startups and incumbents to engage in sustainability-related innovations (e.g. Hockerts and Wüstenhagen, 2010; Weissbrod and Bocken, 2017), how do alliances between companies develop (Doz, 1996), and what are the advantages and barriers when startups and incumbents collaborate (e.g. Rothaermel, 2001; Gans and Stern, 2003; Bannerjee et al., 2016). In this thesis an analytical framework based on SNM and combined with these literatures is formed and used for studying collaboration processes between startups and incumbents which seek to enhance sustainability-related niche innovations.

1.1 Context

This Master's thesis is a part of Bees and Trees research project run by the independent think tank Demos Helsinki and Aalto University School of Business. The two-year project maps the possibilities for cooperation between startups (Bees) and incumbent companies (Trees) in the field of consumer cleantech by facilitating strategic partnerships and studying their results. The selected incumbent companies partnered with a startup that develops a solution that would either reduce waste or emissions or create new business out of existing infrastructure. This thesis is a case study of the facilitated collaboration experiments between the startups and incumbent companies in the Bees and Trees project, focusing on the challenges and opportunities of the collaboration processes. Even though the impact of the collaboration regarding potential changes in the organizations or scaling up of the startups solutions is impossible to study on a narrow time scale, the study is positioned to the field of transition studies to achieve a holistic view to the phenomenon. The study is conducted by interviewing the partnering incumbent companies and startups of the collaboration experiments. Additional insight is gathered by observing the cooperation in a workshop during the process.

The field of consumer cleantech

The startups taking part in the Bees and Trees project and studied in

this thesis can all be categorized to the field of consumer cleantech. Ritola et al. (2015, p. 7) define consumer cleantech as "*products and services which save natural resources by creating new, more flexible, cheaper, and better forms of living.*" Cleantech markets have traditionally been considered as being related to efficient industrial processes, waste and water management systems, or new technologies to produce renewable energy. However, megatrends such as urbanization, resource scarcity, and digitalization are shifting the market towards domains that are nearer to people's everyday life: food, mobility and built environment (Ritola et al., 2015). These domains also produce the majority of CO_2 emissions of consumption (Salo and Nissinen, 2017). The research by Demos Helsinki (Demos Helsinki, 2014; Ritola et al., 2015) has distinguished four major models by which startups create value by proliferating resources: 1) increasing the utilization rate of physical resources by sharing, 2) optimizing the use of physical inputs through the use of feedback, smart home and metering applications, 3) upcycling and refurbishing physical assets, and 4) using smart substitution to replace resource-intensive practises and products. Many of the companies studied by Ritola et al. (2015) were found to utilize more than one of these business models, and this is also the case with the startups studied in this thesis.

What connects the incumbent companies studied in this thesis is that they all operate in the domains where consumer cleantech startups have started to emerge, and they wish to be part of this development rather than stay behind. For being able to adopt new business models or create new products and services, the incumbent companies want to learn how to collaborate with startups which create new products or services related to their fields. The large companies might be the experts in their current markets, but learning from startups can prevent them from being disrupted in the future. Moreover, the incumbent companies operate in industries, which currently do not fit into planetary boundaries. One of the case companies operates in the restaurant sector, where a major sustainability challenge is food waste. Silvennoinen et al. (2012) estimate that 20 % of all food handled and prepared in Finnish restaurant and catering business is wasted. The two other incumbent companies operate in the housing and real estate sectors. It is an important field concerning sustainability since the heating of buildings constitute 40 % of energy use in Finland (Tekes, 2012).

Bees and Trees

The name of the research project – Bees and Trees – comes from research

on social innovations (e.g. Jarvis and Marvel, 2013; Mulgan et al., 2006). According to the model 'trees' are big organizations such as governments, NGO's or companies, which have an established position, resilience and wide networks, but lack creativity. 'Bees' are small organizations, groups or individuals, which have new creative ideas, are agile and energetic, but lack the resources to achieve impact. Social change depends on alliances between 'bees' and 'trees', because these different actors play different roles. Effective innovation also requires 'cross-pollination': applying ideas from one area to problems of another (Jarvis and Marvel, 2013). This thesis does not concentrate on the field of social innovation, but the idea of complementary assets in collaboration and societal impact is nevertheless central. Thus, in the empirical part of the thesis the startups and the incumbent companies are referred to as Bees and Trees.

1.2 Objectives and research question

The topic of this research brings together several streams of literature as demonstrated above. An explorative case study analysis was chosen as a research method, due to its suitability for analyzing contemporary phenomena which are hard to separate from a real-life context (Yin, 2014). At the beginning of conducting this research three objectives were formed to guide the process:

1. To map different theories in the areas of transition studies, sustainable entrepreneurship and innovation, and strategic collaboration.

2. To identify a justified approach for studying collaboration experiments between incumbent companies and startups in the field of consumer cleantech.

3. To explore collaboration experiments in real-life situations and identify challenges and opportunities in them.

This study was conducted inductively as a qualitative case study to explore a current topic with no unambiguous base in the previous literature. Thus, the circularity of the research process allowed the research question to be formed as a dialogue between the empirical data and theoretical enquiries. A final research question was formulated as follows: *How can incumbent companies and startups collaborate with the aim to enhance consumer cleantech innovations?*

The contribution of this study is twofold. Firstly, it brings together several streams of literature which have so far not been combined. The big picture and framework for the study come from the literature on socio-technical transitions to sustainability. To observe specific companies and their roles in enhancing sustainability-oriented innovations, literature about sustainable entrepreneurship and strategic collaboration are reviewed. Thus, the main theoretical contribution is to extend the view of transition studies on these domains. Secondly, from a more practical perspective, the results of the empirical study provide knowledge about challenges and opportunities in collaboration experiments between startups and incumbents, which can be used when designing similar experiments or in the future.

Moreover, this study responds to several suggestions for future research directions arising from the literature on socio-technical transitions and sustainable entrepreneurship. In their analysis of pioneers and incumbents roles in creating more sustainable business, Hockerts and Wüstenhagen (2010) suggest investigating the arenas where pioneers and incumbents interact. Schaltegger et al. (2016) find it important to study both startups and incumbents contribution to a sustainability transformation of the market. Concerning sustainability transitions and experimentation Sengers et al. (2016) see the role of business – and especially large incumbents – in experimentations as a necessary avenue of research. Finally, in their latest work Geels et al. (2017) emphasize the importance of business support and developing organizational capabilities of private sector to accelerate low carbon transitions in the society.

1.3 Structure of the thesis

This thesis is structured as follows. The first chapter has introduced the topic of the research as well as motivation for studying it. It has presented the context of the study and the research question, and addressed the gaps in theoretical as well as practical knowledge. The second chapter reviews existing literature and theories that are relevant for answering the research question. The first section is about transition studies and SNM framework, and the second complements it with perspectives of companies and collaboration. The third chapter describes how the topic was studied presenting the analytical framework and describing the methods of data collection and analysis. In the fourth chapter the empirical findings of the case studies are presented. A cross-case analysis searches for similarities and differences in the cases. Finally, the fifth chapter discusses the the findings of the thesis.

2 Literature

This chapter presents the theoretical background of the study. The first section concentrates on socio-technical transitions to sustainability by presenting two main theories: the multi-level perspective and the strategic niche management. The second section discusses the roles of startups and incumbents in transitions and strategic collaboration between companies.

2.1 Socio-technical transitions to sustainable economy

In systems studies and transition research sectors such as energy supply, construction, food production, or transportation are conceptualized as socio-technical systems. These systems consist of networks of actors (individuals, firms, and other organizations), institutions (regulations and societal and technical norms and practices), material artefacts and knowledge which are tightly interrelated and dependent of each other (Markard et al., 2012).

By the definition of (Rotmans et al., 2001, p. 16) socio-technical transition is a *"set of connected changes, which reinforce each other but take place in several different areas, such as technology, the economy, institutions, behaviour, culture, ecology and belief systems"*. In the course of a transition, new products, services, organizations, and business models emerge and either complement or substitute existing ones, changing technological and institutional structures as well as perceptions of consumers. Transition typically take more than 50 years. Historical transitions studied and often cited in transition studies include the transition from sailing ships to steam ships (Geels, 2002), cargo handling (van Driel and Schot, 2005), and the introduction of pipe-base water supply (Geels, 2006).

Complex sustainability challenges, such as greenhouse gas emissions, air pollution, depletion of natural resources, and energy poverty have become the core target of research on socio-technical transitions. Sustainability transitions are multi-dimensional long-term, fundamental transformation processes through which established socio-technical systems shift to more sustainable ways of production and consumption (Markard et al., 2012). One of the main themes of transitions research for the last decade has been the shift from a fossil-based centralized energy system to a decentralized system based on renewable energy (Loorbach and Wijsman, 2013). Several the-

oretical frameworks and governance approaches have emerged to analyze, promote and steer the transition of different sectors towards more sustainable practices. The normative approach suggesting guidance and long-term goals of the direction is one of the particularities of sustainability transitions as opposed to other (historical) transitions: a range of actors are expected to work towards an intended direction in a coordinated way (Farla et al., 2012). It is, however, important to note, that different actors have different interpretations of what is considered sustainable, and the definition can also change over time (Markard et al., 2012).

2.1.1 Multi-level perspective

First formulated by evolutionary economists Rip and Kemp (1998) the multi-level perspective (MLP) on socio-technical transitions theorizes change between and within three levels: niche, regime and landscape (Geels and Schot, 2007). Micro-level niches are spaces where radical innovation emerge carried and developed by small networks of dedicated actors. Meso-level regimes are highly structured and established alignments of institutions, technologies and actors, where change usually is incremental in a relatively well-defined trajectory. On the macro level, the socio-technical landscape is an exogenous environment, which is largely beyond the direct influence of niche and regime actors, e.g. deep cultural patterns, climate change or globalization. According to the MLP transitions are caused by interactions between processes at the three levels: (1) niche-innovations build-up internal momentum, (2) changes at the landscape level create pressure on the existing regime, and (3) destabilisation of the regime provides opportunities for niche-innovations (Figure 2.1). Alignments of these processes enable niche innovations to break through in the mainstream market and compete with the existing regime (Geels and Schot, 2007).

The MLP identifies critical tensions between stabilising and destabilising forces in transition processes (Geels, 2002). Especially critical are the distinctions and linkages between regime and niche levels (Geels and Kemp, 2007). Why change in a complex socio-technical systems happens so slowly and the need for change is difficult to identify can be explained by the stability of socio-technical regimes. Regimes of different sectors are bound by structures which are path dependent, such as exciting infrastructure, institutional arrangements and formal regulations, but also cognitive rules and ways of thinking (Berninger et al., 2017). Path dependency of existing regimes hinders the possibilities of new innovations and technologies to compete with existing ones. The stabilised system might promote standard

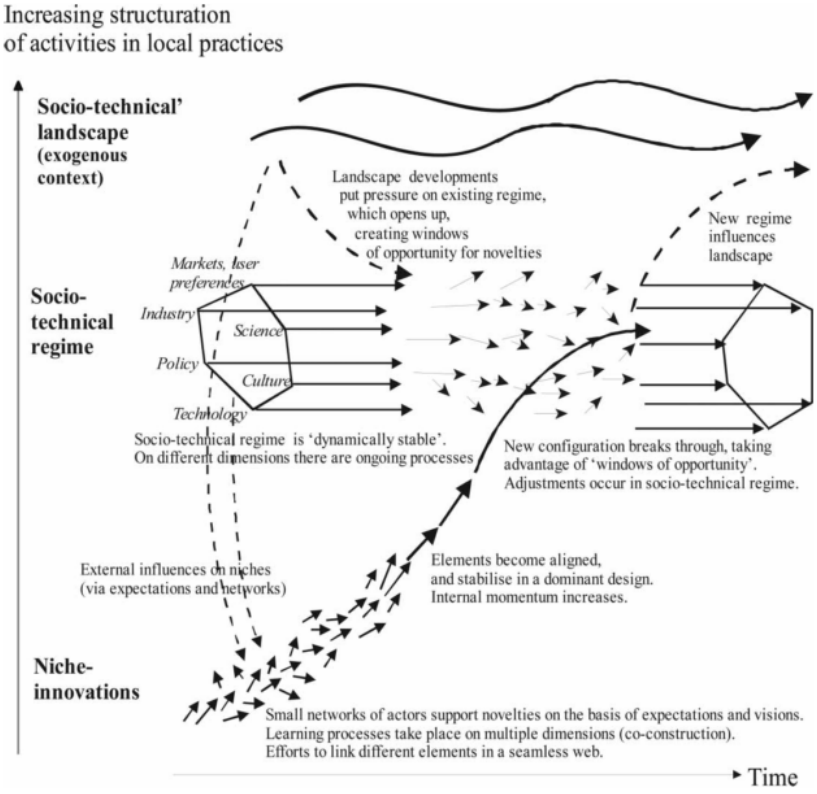

Figure 2.1: Multi-level perspective on socio-technical transitions (Geels, 2002)

solutions even when, if examining outside of the regime, the solutions would be inefficient or even opposed to societal goals. This kind of lock-in allows only incremental innovation along established trajectories (Geels and Kemp, 2007). There are also various actors who benefit from maintaining the existing structures (Berninger et al., 2017).

According to Geels and Schot (2007, p. 402) *"technological niches and socio-technical regimes are similar kinds of structures, although different in size and stability"*. In contrast to regimes being highly structured, large and stable, niches are small, dynamic and unstable. Niches provide protective spaces for alternative technologies and practises to develop outside the competition with regime actors and their narrow selection environment (Smith et al., 2010). In practice niches can be technological such as R&D laboratories or subsidised demonstration projects, or market niches where users with

special demands are willing to support emerging innovations by for example startup companies. Niches provide space for learning processes of various dimensions and build-up of social networks which support the development of the innovation (Geels, 2012). The idea of nurturing new ideas and innovations is further developed in the literature on strategic niche management and will be discussed later in the next subsection.

Transition pathways

As a response to Smith et al. (2005) who stated that the original MLP did not pay enough attention to agency and niche-regime interactions, Geels and Schot (2007) suggest four different transition pathways with the criteria of timing and nature of the interaction between different levels. In the *transformation path* there is moderate landscape pressure, but niche innovations are not yet sufficiently developed to pressure the regime. Thus, the regime actors adjust established technologies and practises and slightly modify the direction of innovation activities. In the *reconfiguration path* symbiotic innovations developed in niches are adopted by the regime actors to solve local problems as add-ons or component replacements. The novelties might end up triggering further adjustments in the regime as technical changes or changes in user practises and perceptions and thereby adding up to major reconfigurations or regime changes. In the *technological substitution path* niche innovations are developed sufficiently, and a landscape pressure creates major regime tensions opening a window of opportunity for niche innovations. The incumbent firms defend themselves by incremental improvements in the established technologies and compete with new firms promoting alternative technologies. Finally, in the *de-alignment and re-alignment path* the regime loses its legitimacy due to sudden and large landscape-level change, and if the niche innovations are not sufficiently developed there is no clear substitute. Multiple niche-innovations compete, and eventually one becomes dominant, forming the core for the re-alignment of a new regime. (Geels and Schot, 2007)

As illustrated through the four pathways the timing of landscape pressure on regimes is particularly important in relation to the development phases of niche innovations. If a niche innovation is fully developed when landscape pressure opens a "window of opportunity", the niche innovation is able to influence or compete with the regime. The nature of interaction describes the types of relationships that niche-level and regime-level actors develop with each other. When radical innovations aim to replace

the regime, the relationship is competitive. However, there are also different kinds of symbiotic relationships, where novelties can be adopted by actors of the existing regime, but continue to influence it from inside. These add-ons or components can solve specific problems and enhance competencies in the regime. (Geels and Schot, 2007)

2.1.2 Strategic niche management

This subsection introduces the concept of strategic niche management which is tightly connected to the multi-level perspective and transition pathways. Strategic niche management is a theoretical framework and governance approach which originally emerged from the observation that many innovations that would potentially make current systems of production and consumption more environmentally sustainable fail to become commercially successful (e.g. Kemp et al., 1998; Hoogma et al., 2002; Raven, 2005). According to the initial definition by Kemp et al. (1998, p. 186) "*strategic niche management is the creation, development and controlled phase-out of protected spaces for the development and use of promising technologies by means of experimentation, with the aim of (1) learning about the desirability of the new technology and (2) enhancing the further development and the rate of application of the new technology*".

A central assumption in strategic niche management is that the processes of niche development play a crucial role in breaking path dependencies of regimes and creating new pathways for innovations (Hoogma et al., 2002). Successful development of niche innovations is assumed to happen through three processes, articulation of expectations and visions, building of social networks and learning on multiple dimensions (Schot and Geels, 2008), which are described in detail below.

1. **Articulation of expectations:** Articulating shared expectation by the participating actors is considered crucial for the niche development, because it provides legitimacy for the niche as well as direction to the learning processes (Kemp et al., 1998). More specifically, expectations may contribute more to the niche development if they are shared by an increasing number of actors, and if they are more concrete and tangible (e.g. backed by ongoing experimentation), and specific in a way that they provide guidance (Schot and Geels, 2008).

2. **Building of social networks:** A growing social network around the niche innovation creates opportunities for stakeholder interaction, and a micro market with the necessary resources (such as money, people

and expertise) for experimentation and temporary protection. Broad and heterogeneous networks allow the articulation of multiple views and enable diffusion of learning. People representing organizations should be able to mobilize commitment and resources in their networks (Schot and Geels, 2008). Regime-outsiders are considered crucial since regime-actors have a tendency to follow prevailing path dependencies (Schilpzand et al., 2011).

3. **Learning processes:** Learning mechanisms between actors and experiments in multiple levels are vital for the establishment of new rules and design heuristics required by the niche. First-order learning refers to the accumulation of facts and data for example about technical aspects, user preferences, regulation or industry networks (Schot and Geels, 2008). Even more important is second-order learning which enables questioning of underlying assumptions and cognitive frames. First-order learning gives answers to the question "are we doing things right" while second-order learning is about "are we doing the right things" (Schilpzand et al., 2011).

The early work on strategic niche management gave a strong focus on internal niche processes as being sufficient to guiding new technologies to the markets (Hoogma et al., 2002). Regime actors were assumed to be defensive towards experimentation of sustainable niche innovations rather than responding proactively. However, niches do not exist in a vacuum. Even though there is a correlation between internal niche experiments and outcomes in terms of technological and market niche development, external factors also play a crucial role. The probability of the niche's success depends especially on the possibilities the regime offers (Raven, 2005). The recent work on interactions between niche and regime levels in strategic niche management has developed parallel to the multi-level perspective on socio-technical transitions.

As the multi-level perspective suggests, regime transformations come about through alignments of processes at the three levels of niche, regime and landscape. Thus, niche innovations can diffuse only if they link up with ongoing processes at regime and landscape levels (Schot and Geels, 2008). Regime instability caused by niche and landscape pressures can facilitate the emergence and development of niche innovations. According to Raven (2005, p. 260) there are three ways to achieve this: *"First, regime instability can create local opportunities for experiments, because niche actors develop expectations and visions linked to regime instability. [...] Second, when stability in the regime decreases, regime actors may become interested in the*

niche they expect the niche to be a promising option for the future. [...] Third, in cases of very high instability, regime actors may adopt the niche as a problem solver". Raven analyzed how biomass was adopted to the electricity production regime through co-firing with coal due to stricter regulatory pressure and learning processes. Futhermore, Smith and Raven (2012) differentiate three types of processes of deliberately up-scaling niche innovations: shielding, nurturing and empowering. Shielding refers to protecting new innovations from mainstream selection pressures of the regime, and nurturing to processes such as building networks and expectations that support the development of an innovation. The third process, empowering, can be understood as either developing the niche innovation to be competitive in the selection environment of the regime (fit-and-conform) or contributing to changes in the mainstream environment to make it more favorable to a niche innovation (stretch-and-transform) (Smith and Raven, 2012).

Applications of the theory

As an ex-post framework strategic niche management has been applied to various contexts and cases such as the development of organic food niches in the United Kingdom (Smith, 2006), hybrid vehicle development (Sushandoyo and Magnusson, 2014), biomass technology development in Denmark and the Netherlands (Raven, 2005), sustainable transportation development in several areas (Hoogma et al., 2002), and sustainable innovation in the Danish construction sector (Thuesen and Koch, 2011). Some of the core assumptions of SNM have also been challenged and extended in several studies. For example Hegger et al. (2007) and Monaghan (2009) introduce the concept of conceptual niche management as a critique to the focus of explicit technologies and their development in SNM. Conceptual niche management proposes experimentation with concepts and guiding principles rather than innovative technologies, to better introduce niche ideas to incumbent regimes. Hegger et al. (2007) emphasize that in many industries potential breakthrough technologies are available, so the real challenge is not technological experimentation, but dealing with the complexity of the social reality and finding opportunities to modernize existing systems. In addition, Schilpzand et al. (2011) suggest that the approach could be useful for analysis and governance of also other types of socially desirable change than sustainability. Their case study is about the development of Near Field Communication (NFC) technologies for mobile payment against the prevailing regimes of banking and mobile technology, where the value at stake is

privacy.

Some researchers have also suggested how strategic niche management could be used as a guideline for practitioners interested in how to incubate radically new technological or social innovations (e.g. Caniëls and Romijn, 2006; Mourik and Raven, 2006; Raven et al., 2010). However, as Mourik and Raven (2006) point out, one reason for the lack of practical guidelines is that scholars of SNM and the multi-level perspective have emphasized the complexity and contingency of transitions, and argued that transitions are by definition impossible to manage. Caniëls and Romijn (2006) suggest another reason for the lack of practical applications of SNM. Even though SNM provides a coherent perspective on how technological innovation processes develop as a result of interacting stakeholders in a broad societal context, it has no clear connection to business management studies, which concentrate on the practical management of innovation processes that are conducted by people within particular organizations: *"... SNM could benefit a great deal from the lessons that have already been drawn from company experiences with radical innovation in the strategic management literature. The analysis in these studies is not couched in terms of regimes, niches, and path dependency, but there cannot be any doubt that the experiences involved in new product development processes do in many respects resemble the incubation and learning processes documented"* (Caniëls and Romijn, 2006, p. 2). The call for addressing the intersection between business, management, and corporate sustainability perspectives and transition studies in general is also shared by Markard (2017). Closely related to the research question of this thesis he suggests further research on the topic of how innovators tackle the challenge that incumbent actors control critical resources and obtain central positions in existing industries and networks, and under which conditions do they compete or collaborate. Additionally, Sengers et al. (2016) propose to study under which conditions incumbent firms may benefit from experimenting with niche innovations, and how this would help to bridge the niche-regime divide.

To conclude

Many of the concepts and empirical studies in sustainability transitions have emphasized the systemic nature of innovation processes on a very broad level, which has inevitably been useful for sketching the big picture. However, to some point this might have come at the expense of paying closer attention to specific actors and agency (Farla et al., 2012) and the different

roles of businesses in the analysis (Sengers et al., 2016). The next section aims to partly fill this gap by discussing the roles of different types of companies in sustainability transitions. The literature on sustainable entrepreneurship uses somewhat different terms and the scholarly fields have not often been analyzed together (with some exceptions, see Horisch (2015) and Gibbs and O'Neill (2014)), but links and similarities are aplenty. Furthermore, the literature on alliances between startups and incumbents provide one concrete example of interactions between niche and regime-level actors.

2.2 Perspectives of companies and collaboration

This section complements the literature on sustainability transitions and strategic niche management by shifting the focus on companies and their collaboration. First, the literature on sustainable entrepreneurship and innovation provide insight into the different roles of startups and incumbent companies regarding sustainability transitions. Second, the literature on strategic alliances examines how and why different types of companies collaborate, and what are the specific implications for collaboration between startups and incumbents.

2.2.1 Startups and incumbents transforming markets

Transition studies assume that sustainable innovations are created by actors outside the prevailing regimes and regime-level actors are resistant to change, but given the right circumstances can adopt innovations as specific problem solvers. But what are the roles and capabilities of startups and incumbent companies in creating and advancing radical sustainable innovations and thus possibly contributing to sustainability transitions? There is a vast body of research about sustainability-oriented innovation and radical innovation (e.g. Garcia and Calantone, 2002; Carrillo-Hermosilla et al., 2010; Boons et al., 2013; Oksanen and Hautamäki, 2015). Following Weissbrod and Bocken (2017) this subsection draws on the proposition by Hall et al. (2010) that radical sustainability-oriented innovation is explicitly linked to entrepreneurship. Thus, the wider discussion around sustainability-oriented innovation is excluded, and the focus is on entrepreneurial capabilities of startups and incumbents.

Startups and sustainable innovation

The role of startups in creating sustainability-related innovations has primarily been studied in the field of sustainable entrepreneurship (e.g. Cohen and Winn, 2007; Dean and McMullen, 2007; Hall et al., 2010; Hockerts and Wüstenhagen, 2010). The emergent field is based on notions that sustainable development drives disruptive innovation (Christensen, 1997; Cohen and Winn, 2007) and sustainable entrepreneurial opportunities can be found in market failures. Building on Venkataraman's (1997) definition of entrepreneurship, Dean and McMullen (2007, p. 58) define sustainable entrepreneurship as *"the process of discovering, evaluating, and exploiting economic opportunities that are present in market failures which detract from sustainability, including those that are environmentally relevant"*. As Blank (2013) defines a startup as *"a temporary organization designed to search for a repeatable and scalable business model"*, sustainability-oriented startups are also expected to aim for market growth to be able to contribute to sustainability transformations of incumbent industries[1] (Hockerts and Wüstenhagen, 2010). Other sustainability-driven niche players (not necessarily aiming for a scalable business model) have been referred to as *bioneers* or *social bricoleurs* (Schaltegger et al., 2016).

Irrespective of sustainability-orientation, startups are highly focused on one task (Blank, 2013), which makes them more likely to succeed in primary innovation compared to incumbents (York and Venkataraman, 2010). Small firms are quick to react to changes in the operational environment and adapt to learning derived from product and service experiments (Weissbrod and Bocken, 2017). In addition, personal values have been identified as a key motivation for pursuing sustainability-oriented entrepreneurs (Bocken, 2015). Furthermore, as sustainable startups are often run by idealists, they are less likely to be stuck in a specific technological mindset, but rather be open for various innovative approaches (Hockerts and Wüstenhagen, 2010).

There is an increasing global demand for sustainability-oriented innovations, but for startups the market access it often difficult (Antikainen et al.,

[1]The term 'transformation' is used somewhat differently in the fields of transition studies and sustainable entrepreneurship. This might be due to the novelty of both scholarly fields and the fact that connections between the two fields are still few. According to the transition pathways by Geels and Kemp (2007) transformation path refers to incremental innovation by adjusting established technologies. However, sustainable entrepreneurship scholars refer to industry transformation when disruptive startups influence incumbents and the whole industry toward more sustainable practices (e.g. Hockerts and Wüstenhagen, 2010; Schaltegger et al., 2016).

2016). Startups might have insufficient networks, difficulties in getting financing and not enough information about customer needs. Customers are often not willing to pay the higher price of a sustainable product or service even though eventually it would pay itself off for example by providing energy savings (ibid.). To achieve disruptive change in incumbent industries, Hockerts and Wüstenhagen (2010) suggest that both startups and incumbent players are needed, and their co-evolution results in sustainability transitions. First, innovative niche pioneers launch innovations to the market, but the growing trend is capitalized by market incumbents by small line extensions. Following this, more ambitious high-growth startups start to emerge, and incumbents begin to see both a competitive threat from the startups and real market potential in sustainable business for themselves (Figure 2.2). Examples of this can increasingly be seen in fields such as construction, food and renewable energy (Hockerts and Wüstenhagen, 2010). The following takes a closer look at incumbents' perspective.

Incumbent companies and sustainable innovation

The sustainability transformation of incumbent companies and industries often begins as a reaction to pressure from stakeholders concerned about sustainability issues or as a response to stricter regulation (Hockerts and Wüstenhagen, 2010). This 'corporate greening' largely means incremental process innovation, such as adopting sustainability communications and management systems, improving waste management systems or reducing material resources needed in production. Incumbent firms often find it easy to operationalize sustainability from an efficiency perspective (Dyllick and Hockerts, 2002), but they may face severe difficulties in adapting to radical changes and new technologies, including the transformation to sustainable business (Hockerts and Wüstenhagen, 2010). This is in line with the concept of creative destruction by Schumpeter (1942) by which radical innovations lead to the replacement of incumbents with new entrants. For example, past investments and existing assets anchor incumbent companies to business-as-usual thinking and restrict the engagement to new, sustainable innovations (Hockerts and Wüstenhagen, 2010).

Introducing radically new products or services is a difficult process for incumbents (Sandberg and Aarikka-Stenroos, 2014), and it requires specific organizational capabilities (Garcia and Calantone, 2002). Sandberg and Aarikka-Stenroos (2014) identify restrictive mindset and the lack of competencies as key barriers to radical innovation in large companies. According

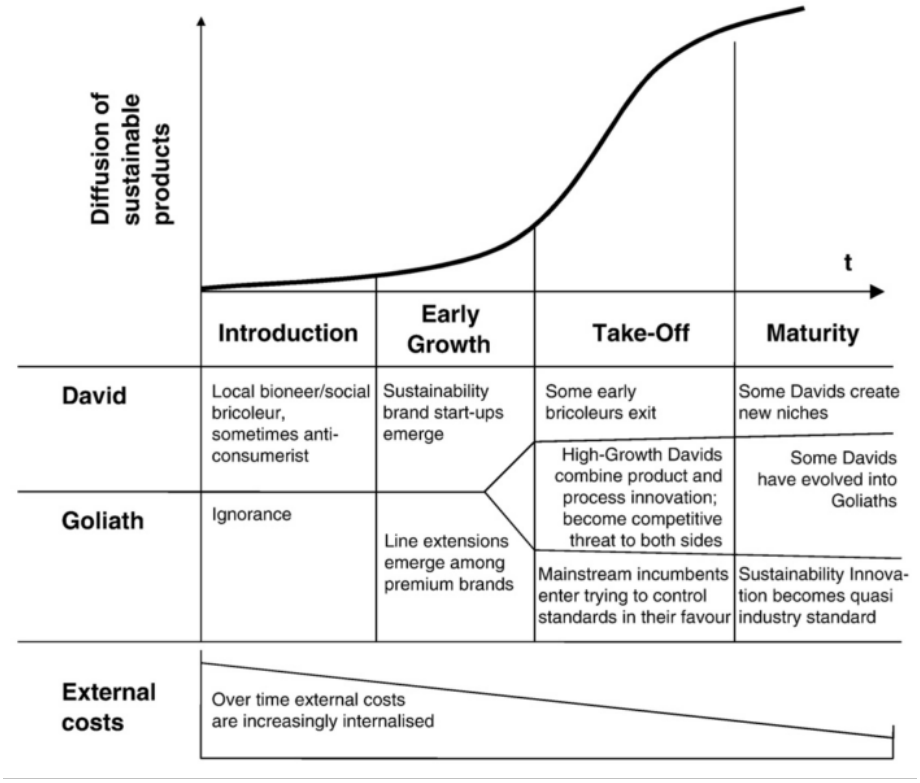

Figure 2.2: Co-evolution of pioneers and incumbents for industry transformation (Hockerts and Wüstenhagen, 2010)

to Chang et al. (2012) the most significant organizational capacity which enhances the radical innovation performance is the capability to experiment. Weissbrod and Bocken (2017) studied an incumbent clothing retailer aiming to adopt a more sustainable, circular business model through an experimental approach, and found out the dominant corporate mindset of economic value creation still dominated strongly. The authors argue that dynamic capabilities are necessary for large companies to enable radical innovations and to adapt to urgent sustainability challenges. Teece (2007) defines dynamic capabilities as a firm's ability to sense, seize and reconfigure internal and external competencies to address rapidly changing environments.

Incumbent companies have, however, several advantages concerning radical sustainability-oriented innovation. Incumbents can easily become fast

followers because of their market power, financial resources and superior capabilities of process innovation (Hockerts and Wüstenhagen, 2010). While startups often concentrate on one or two sustainability issues, incumbents have a possibility to address multiple issues and develop a broad sustainability performance (ibid.). Apajalahti et al. (2017) argue that incumbent companies can be able to shape emerging fields by bringing credibility to the field, frame the new field as a central part of a long-term vision and expand field boundaries as well as form alliances and mobilize resources. These processes might have positive effects, but it is also common that incumbents try to restrict the development of innovations which threaten their current business. According to Smink et al. (2015) defensive strategies by incumbent companies may substantially decrease the potential of transformative change from new innovations.

2.2.2 Strategic collaboration

Different types of networks and alliances between businesses have received attention by researchers since 1980's (e.g. Birley, 1985; Devlin and Bleackley, 1988; Hamel, 1991; Doz, 1996), and during the past two decades the focus has increasingly shifted to alliances between startups and incumbents (e.g. Rothaermel, 2001; Gans and Stern, 2003; Weiblen and Chesbrough, 2015). In a strategic alliance two companies decide to share resources to undertake a specific project that is beneficial to both companies (Hamel, 1991). The role of collaboration as a driver for innovation has yielded more and more evidence in recent years (Davis et al., 2015). Furthermore, strategic partnerships, networks and alliances have been recognized as an essential tool to achieve sustainable and transformative change in businesses (SustainAbility, 2016). The final subsection of the literature review takes a look at strategic alliances, advantages and barriers in them for startups and incumbents, and intermediary organizations' possibilities to enhance the collaboration.

Motives and processes of strategic alliances

Several theories provide explanations for collaboration between companies. Transaction cost theory of alliance-forming is based on the view of transaction cost economics stating that a firm's ownership decision centres on minimizing the sum of production costs and transaction costs (Coase, 1937; Williamson et al., 1991). When asset-specificity is medium (transaction cost are not especially high or low), alliances are considered the most efficient form to organize business (Williamson et al., 1991). While the trans-

action cost theory emphasizes cost minimization, the resource-based theory on alliances emphasizes value maximization of a company through pooling and utilizing resources (Eisenhardt and Schoonhoven, 1996; Das and Teng, 2000). From this perspective alliances are formed when a company needs additional resources, which cannot be bought via market transaction, or built internally with acceptable cost or amount of time. Furthermore, Eisenhardt and Schoonhoven (1996, p. 1) suggest that *"alliances form when firms are in vulnerable strategic positions either because they are competing in emergent or highly competitive industries or because they are attempting pioneering technical strategies"*.

Learning from partners is the essence of strategic alliances (Doz, 1996). Strategic alliances evolve when learning in the partnering companies takes place or fails to do so. However, learning is a difficult process, and organizations will not necessarily actively seek to acquire it (Serrat, 2009). The literature on strategic alliances largely concentrates on explaining patterns of alliance formation or initial characteristics related to alliance outcomes, but fewer studies have analyzed the development of strategic alliances as evolutionary processes. However, Doz (1996) suggests that successful alliance processes go through a sequence of interactive cycles of learning, re-evaluation, and readjustment. In contrast, failing projects are described as highly inertial, with little learning. Doz (1996) conceptualizes the initial phase of collaboration as the interaction between four initial conditions – (1) task definition, (2) partners' organizational routines, (3) interpartner interface design, and (4) partners' expectations about performance, behaviour and motives – and five learning dimensions – (1) environment, (2) task, (3) process, (4) skills, (5) and goals (Figure 2.3). The initial conditions can either facilitate or hamper the learning processes, both cognitive and behavioral[2]. The learning of the interactions allows the partners to monitor the alliance and each other for efficiency, equity and adaptability, which then leads to periodic re-evaluations of the alliance. The re-evaluation, in turn, leads the alliance partners to make adjustments to their relationship and move away from the initial conditions. The author emphasizes the importance of early steps of the collaboration in order to carefully build trust and confidence by engaging in less critical tasks, and increase the stakes only at a later stage after a learning cycle. Thus, initial conditions are a key enabler of alliance evolution, but they can either block learning and adaptation or

[2]Cognitive learning refers to understanding how the alliance relationship should be handled, and behavioral learning refers to being able to change behavior according to the cognitive learning in order to better manage the relationship (Doz, 1996).

foster it (Doz, 1996).

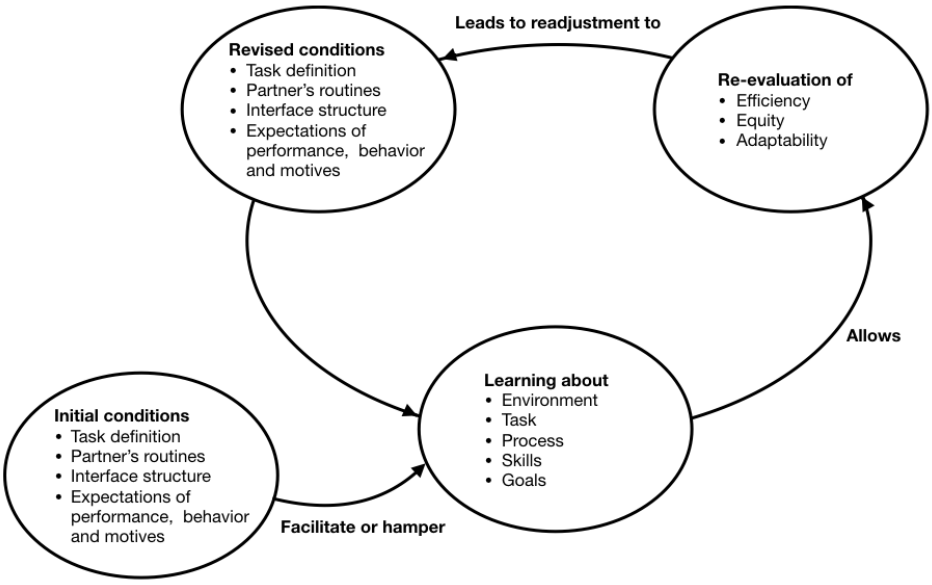

Figure 2.3: Simplified process of alliance evolution (Doz, 1996)

Advantages of startup–incumbent collaboration

For incumbent companies collaborating with startups is most often linked to adaptation to technological change (Rothaermel, 2001). Instead of seeing startups only as agents of disruption, through collaboration incumbent companies strive to transform them into engines of corporate innovation (Weiblen and Chesbrough, 2015). In addition, the cooperation between incumbent companies and new entrants may improve the performance of the incumbent industry (Rothaermel, 2001). The advantages of startup collaboration are closely related to the paradigm of open innovation, which assumes that firms should use external sources of ideas as well as internal, and internal and external paths to market (Chesbrough, 2003). Open innovation is suggested to lead to better adaptation to dynamic market needs, shared resources and risks among partners as well as higher commercial returns (e.g. Chesbrough, 2003; Du et al., 2014). Moreover, incumbent companies often end up launching things they can make, not what people want (Yoon and Hughes, 2016). According to Gans and Stern (2003) incumbent com-

panies might overestimate the potential of further improving their existing technologies at the expense of recognizing the growth potential of emerging solutions. As established companies often focus on responding to the needs and requirements of current customers, they become vulnerable to new customer segments, which is then exploited by startups. Large companies can gain access to some benefits of startups by early stage-funding and later acquisitions (Yoon and Hughes, 2016). However, financial and transactional relationship, do not provide the same benefits than strategic alliances. Yoon and Hughes (2016) suggest that collaboration between startups and incumbent companies should be personal and mission-oriented to be successful.

For startups collaboration with incumbent companies is often linked to commercialization strategies (Gans and Stern, 2003) and an easier access to the market (Rothaermel, 2001). Alliances with large companies allow startups to get access to complementary resources and capabilities (Neyens et al., 2010). Complementary resources might be physical resources, financial resources or human resources. Complementary capabilities accessed through large companies can be for example distribution, manufacturing or marketing capabilities, which are necessary to commercialize new ideas (Eisenhardt and Schoonhoven, 1996). The necessary complementary assets are often the reason why startups choose collaborative partnerships with incumbent firms instead of attacking or competing with them (Rothaermel, 2001). Thus, Rothaermel (2001) suggests that strategic alliances are beneficial for both incumbents and new entrants, when the entrants are providers of new, radical technologies and incumbents possess complementary assets to commercialize the technology. Moreover, startups often lack reputation and legitimacy since both of these are built over time (Neyens et al., 2010). Stuart et al. (1999) suggest that alliances with prominent partners might have an important signalling effect, which positively influences the reputation of a startup.

Barriers to startup–incumbent collaboration

From the startup perspective corporations are often hard to approach, cultural differences lead to misunderstandings and different organizational clock speeds hamper collaboration processes along the way (Weiblen and Chesbrough, 2015). According to Bannerjee et al. (2016) increasing number of corporations are recognising the benefits of collaborating with startups, but in reality many companies struggle to even try it in the first place or fail to implement their collaboration programs. The authors identify

common barriers to startup collaboration within incumbent companies on four levels: strategic, structural, cultural and process-related. On a strategic level misalignment between departments or units regarding the role and purpose of external collaboration is a common problem, especially when the management responsibility is shifted from one unit to another. Structural barriers often refer to rigidly hierarchical decision-making structure: those who have a mandate to make decisions have a long distance to the lower level employees who could be in the best place to judge the need to a specific innovation. Bannerjee et al. (2016) suggest that both of these barriers can be tackled by ensuring support from the top level of the organization. An approach often cited in innovation literature (e.g. Chakrabarti, 1974; Howell and Boies, 2004) is to appoint an internal innovation champion, who can be directly approached with interesting proposals. In addition to budgetary and decision-making power, it is important that the innovation champion has a permission to cut across silos in the organization.

Cultural barriers are common, since entrepreneurial culture, which encourages risk-taking, tolerates failures and promotes learning, is not often found in incumbent companies. The lack of entrepreneurial culture most often is the collective result of employees concentrating on their existing role and not thinking or acting outside their job description (Bannerjee et al., 2016). The legitimacy provided by the senior management as well as the ability to communicate about the firm's attitude to risk can help to overcome cultural barriers. The problem of inflexible and lengthy processes often discourages startups from partnering with large organizations. However, internal processes in large firms usually exist for a reason, and make it possible to exploit the existing opportunities. On the other hand, optimization of processes leads to not being able to manage new and unexpected situations (Bannerjee et al., 2016). In strategic management literature organizations who are simultaneously able to manage both incremental and disruptive innovation are referred to as ambidextrous organizations (Tushman and O'Reilly, 1996). Some large companies overcome the process barrier by creating parallel processes for startup collaboration. In practise it can mean for example a special legal staff working with startup deals or having a faster procurement channel for startups (Bannerjee et al., 2016).

Intermediaries in collaboration processes

Collaboration between different kinds actors is challenging, as described above. Thus, various kinds of third-party organizations have been recognized

as important enablers of partnerships and drivers of innovation (Howells, 2006). Research about the roles of intermediaries has yielded attention in the fields of innovation networks and open innovation (Howells, 2006; Hossain, 2012; Batouk, 2015; Caloffi et al., 2015) as well as sustainability transitions (van Lente and Hekkert, 2003; Kivimaa, 2014).

Howells (2006, p. 720) defines an intermediary as *"an organization or body that acts an as agent or broker in any aspect of the innovation process between two or more parties"*. Intermediaries have also been identified with terms such as third parties, bringing organizations, boundary organizations and knowledge brokers (Caloffi et al., 2015; Hossain, 2012). Research has identified several functions for innovation intermediaries. One comprehensive list is based on the work of Howells (2006) who studied innovation intermediaries in the UK. Batouk (2015) divides the functions found by Howells (2006) into following three categories: (1) connecting actors, (2) facilitating the collaboration between actors, and (3) providing services for stakeholders. In enabling collaboration between startups and incumbents the categories one and two are especially relevant. The activities in the connecting category include for example linking innovation providers and innovation seekers as well as negotiating and deal-making (Lopez-Vega and Vanhaverbeke, 2016). In the case of startups and incumbents these activities have mostly been studied in regards to corporate incubators and accelerators (e.g. Becker and Gassmann, 2006). Facilitating collaboration includes for example processing and combining knowledge between parties and articulating needs and requirements (Batouk, 2015) to increase understanding between different kinds of actors and enhance the collaboration.

3 Framework and methods

This chapter describes how the topic was studied. First, the analytical framework for the case study analysis is presented. In the second section, the choices concerning the research approach are clarified and the method of multiple-case study research is introduced. The third section introduces the case study, which includes the setting of the collaboration project and description of the companies involved. The last two sections describe how the data for the research was collected and analyzed.

3.1 Analytical framework

To analyze the collaboration experiments between incumbents and startups in the field of consumer cleantech, strategic niche management approach is chosen as a starting point. Incumbent companies in traditional fields are assumed to operate largely within the structures of existing regimes (Geels, 2011). The startups with disruptive solutions are assumed to operate at the niche level and not immediately fitting to the structures of existing regimes (ibid.). In the SNM literature niche innovations are exposed to the market through various experiments. From this perspective, collaboration experiments between the incumbent companies and startups are considered as one stage of experiments for exposing the niche innovations to the regime structures.

In SNM three dimension are assumed to be especially relevant for the development of niche innovations: articulation of expectations, building of networks and learning processes. In addition to this, the external environment around the niche (how its development aligns with the regimes structures and landscape developments) is considered crucial. This dimension is added to the framework as operating environment of the companies.

Transition studies and SNM approach give limited attention to specific actors (Berggren et al., 2014) and the role of incumbent companies in advancing sustainability transitions (Sengers et al., 2016). In addition, it has previously not been used for analyzing collaboration projects or experiments between specific companies. Thus, regarding these aspects the framework is extended with perspectives of companies to radical innovation and collaboration introduced in the previous chapter. For each dimension SNM perspective is extended by asking what the dimension would mean in the firm-level and the case of incumbent companies and startups collaborating

to enhance radical innovations. The extended framework and its operationalization are presented in the following and summarized in the Table 3.1.

1. Operating environment:

According to SNM, the probability of the niche's success depends on the possibilities the regime offers (Raven, 2005). Thus, niche innovations can diffuse only if they link up with ongoing processes at regime and landscape levels as suggested by the multi-level perspective (Schot and Geels, 2008). Regime instability caused by niche and landscape pressures can facilitate the development of niche innovations. In the empirical case, the operating environment dimension is used for studying the startups and incumbents perspectives on the landscape developments, regime lock-ins and path-dependencies, and the possibilities of the niche innovation to be adopted to the regime.

2. Articulation of expectations:

According to SNM, articulating shared expectation concerning a niche innovation is considered crucial for the niche development, because it provides legitimacy for the niche as well as direction to the learning processes (Kemp et al., 1998). More specifically, expectations may contribute more to the niche development if they are shared by an increasing number of actors, if they are more concrete and tangible (e.g. backed by ongoing experimentation), and specific in a way that they provide guidance (Schot and Geels, 2008). The process of alliance evolution by (Doz, 1996) similarly emphasizes the expectations of the partner's performance, behaviour and motives as part of initial conditions, which are revised by the actors as the collaboration proceeds. For example Rothaermel (2001) and Gans and Stern (2003) provide insight into the motives of startups and incumbents towards collaboration. In the case study, the dimension of articulating expectations is approach by studying the motives and expectation of the companies towards the collaboration project and the partnering organization, and how these align and develop during the project.

3. Building of networks:

According to SNM, a growing social network around the niche creates opportunities for stakeholder interaction and allows a mobilization of necessary resources (such as money, people and expertise) for experimentation. Broad and heterogeneous networks allow the articulation of multiple views

and enable diffusion of learning. People representing organizations should be able to mobilize commitment and resources in their networks (Schot and Geels, 2008). Since regime-actors have a tendency to follow prevailing path-dependencies, regime-outsiders are considered crucial (Schilpzand et al., 2011). In the collaboration experiments of the empirical case, the network consists of three types of actors: the incumbent organization, the startup, and the intermediary organization facilitating the project. Studying the network building within the incumbent (to mobilize commitment and resources) requires insights from studies on collaboration advantages and barriers. Hence, the structural alignment within the company is analyzed as well as top-level support (Bannerjee et al., 2016). How the network develops between the incumbent and startup is analyzed in the light of different approaches towards radical innovation (e.g. Weissbrod and Bocken, 2017; Hockerts and Wüstenhagen, 2010), which might result in cultural barriers (Bannerjee et al., 2016) in collaboration between the actors. Howells (2006) and Batouk (2015) provide insight into the intermediary's role in the network building and advancing the collaboration.

4. Learning processes:

According to SNM, learning mechanisms between actors and experiments in multiple levels are vital for niche development. First-order learning refers to the accumulation of facts and data for example about technical aspects, user preferences, regulation or industry networks (Schot and Geels, 2008). Even more important is second-order learning which enables questioning of underlying assumptions and cognitive frames. First-order learning gives answers to the question "are we doing things right" while second-order learning is about "are we doing the right things" (Schilpzand et al., 2011). Learning between actors is also similarly emphasized in the development cycle of strategic alliances by Doz (1996). Learning is considered effective when the accumulation of facts is combined with questioning of assumptions or changed behaviour. The learning dimension is approached in the empirical case by studying what the companies learned about the niche innovation and the collaboration, and if any evidence of second-order learning can be found.

DIMENSION	SNM APPROACH	ADDITIONAL LITERATURE	OPERATIONALIZATION
OPERATING ENVIRONMENT	Niche develops when it aligns with ongoing processes at regime and landscape levels		What kind of landscape trends create pressure to the incumbent and how does it respond to them? How do the trends open opportunities for startups? What kind of regime structures might hinder the development of the startup's innovation?
ARTICULATION OF EXPECTATIONS	Niche develops when expectations are shared between actors and become more concrete and tangible	Motivation for collaboration (Rothaermel, 2001; Gans and Stern, 2003) Expectations of performance, behaviour and motives (Doz, 1996) Strategic alignment of partnership goals (Bannerjee et al., 2016)	What were the motives for the project and how did they align? How did expectations of the collaboration process align and develop?
BUILDING OF NETWORKS	Niche develops when the network becomes broad and heterogenous, and organizations achieve to mobilize commitment and resources	Structural and cultural alignment and the importance of top-level support to enhance collaboration (Bannerjee et al., 2016) Different approaches towards radical innovation (e.g. Weissbrod and Bocken, 2017; Hockerts and Wüstenhagen, 2010) Roles of intermediaries in collaboration (Howells, 2006; Batouk, 2015)	How was the interest and action mobilized in the incumbent and was there top-level support? How did the communication and trust building develop between the companies? How did the intermediary organization enhance the collaboration process?
LEARNING PROCESSES	Niche develops with 1st order learning (accumulation of facts) and 2nd order learning (questioning underlying assumptions)	Learning about environment, task, process, skills and goals in alliances (Doz, 1996)	What did the companies concretely learn about the niche innovation? What did the companies learn about collaboration? Did the learning change assumptions or behaviour of the companies and how?

Table 3.1: Analytical framework

3.2 Research approach and design

Qualitative research is often inductive by nature, which means that the research process develops starting from empirical materials, not from theoretical propositions (Eriksson and Kovalainen, 2008). This kind of approach offers an opportunity to investigate a phenomenon without strict presumptions or hypotheses about the findings or results of the research (Eskola and Suoranta, 1998). An inductive approach does not mean that the researcher should not position the subject theoretically, quite the contrary. It only means that the framework should be chosen according to the empirical material, and not the other way around. During the research process, an inductive approach gives an opportunity to remain adaptive, and even reformulate the research design and research question as the work proceeds (Saunders et al., 2009).

According to Yin (2014) research design is the logical sequence which connects the empirical data to a study's research question and finally to its conclusions. The main purpose of research design is to guide the research process to make sure that the evidence addresses the research question. Eriksson and Kovalainen (2008) suggest that qualitative research seldom matches the linear, hypothetic-deductive logic of doing research. A more realistic picture of qualitative research is a circular process where it might be necessary to move back and forth during the phases of the research processes. This can also be seen in Figure 3.1, which illustrates the design of this research process. Since the research was designed to explore a contemporary phenomenon, the research question and literature concerning it were revisited several times during the processes of data collection and analysis. These processes are presented in the next sections of this chapter in detail.

Ontologically, this research follows interpretive philosophy, where the focus is to understand socially constructed society through meanings in context (Eriksson and Kovalainen, 2008). The topic of this research would be difficult to explore from the viewpoint of an objective outsider since the data centres around human understanding and interpretation of situations. According to Saunders et al. (2009) subjectivist view acknowledges that multiple individual realities and subjective meanings are accepted as knowledge.

Multiple-case study research

This study is conducted as a qualitative case study research. Accord-

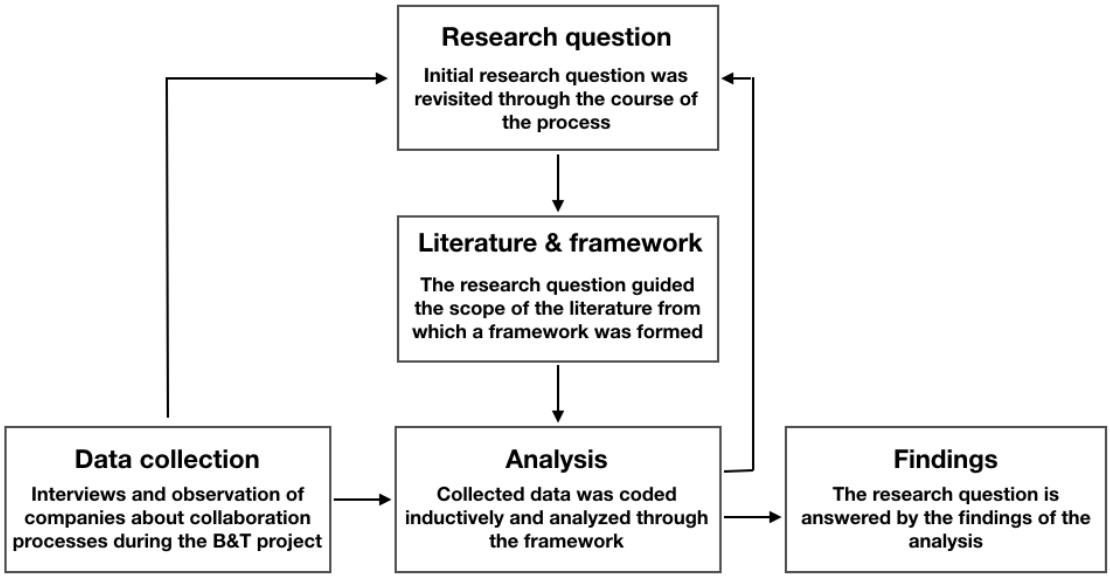

Figure 3.1: Research design

ing to (Yin, 2014) case studies offer a way to investigate a complex social phenomenon in its real-life context. The purpose of a case study is to understand what the case is about and what can be learned from it (Eriksson and Kovalainen, 2008). Case studies are especially useful in a situation where the researched phenomenon and its context are difficult to separate from each other. Moreover, case studies can be a preferred research strategy when the researcher has little or no control over the studied events and the events are contemporary. The researcher then approaches the situations by asking "how" and "why" questions to understand them better (Yin, 2014).

As a distinction to a single-case study, a multiple-case study is used, with the cases being three incumbent companies collaborating with consumer cleantech startups. There are generally two types of case studies: intensive and extensive. In intensive case study research the focus is on developing a deep understanding of one or a few cases (for example organizations), while extensive case study aims at mapping common patterns and mechanisms in a chosen context for the purpose of developing, elaborating or testing a theory (Eriksson and Kovalainen, 2008). This study is an extensive case study research since the aim is to generate knowledge which contributes to the research on strategic niche management and provides practical insight

which can be useful for similar kinds of startup–incumbent collaborations or business experiments in the future. Thus, the approach to the cases is instrumental, aiming to generate knowledge that extends beyond the cases themselves (ibid.).

Multiple-case studies are often considered more robust than single-case studies, because they allow for comparisons between the cases, and may lead to more compelling evidence (Yin, 2014). The data of this research comprises of three cases which all include two companies: one startup and one incumbent company. The cases do not make a random selection of start–incumbent collaboration processes. Rather, they are chosen because they might be able to extend existing theories and knowledge, in this case especially the field of transition studies and the approach of strategic niche management. On a more general, level the unit of the analysis for the case study is the development of three experimental collaboration processes between a startup and an incumbent company, which started in November 2016 and ended in October 2017. The setting of the project in which the companies were involved is presented in the next section to better understand the context in which the data were collected.

3.3 Introduction to the case

The empirical case study conducted in this thesis is about three collaboration experiments between incumbent companies and startups in the field of consumer cleantech facilitated by the intermediary organization Demos Helsinki. This section describes the setting of the project in order to understand how the companies were taking part and what kind of events included in the project. This follows with brief introductions to the companies involved in each case.

3.3.1 Project setting

The overall project can be divided into four phases: match-making, Innovation Camp, experimentation, and Scale-up Camp. Primary data for this thesis was only collected during the experimentation phase by interviews and the Scale-up Camp by observation (these are described in the next section 3.4.), but in the interview material the whole process is reflected. Thus, the phases of the project are introduced in the following and in Figure 3.2.

1. *Match-making:* The starting point for the collaborations was an informal match-making event organised by Demos Helsinki in November

2016. The incumbent companies, as project partners, had a chance to get to know several interesting startups in the field of consumer cleantech, invited by Demos. The idea of the event was to increase positive expectations of the project and enhance the possibilities of a successful collaboration start in the Innovation Camp. In the event several startups got the possibility to pitch their solutions. After further discussions with the startups, all incumbent companies chose two to three startups with whom to work in the Innovation Camp.

2. *Innovation Camp:* The aim of the Innovation Camp was to create common understanding between the partnering companies and to plan the collaboration. The first day was about sharing expectations and concerns, and creating initial goals. The large companies shared knowledge about their companies and industries, and startups about new business opportunities, and rapid developing. The second day was about planning the collaboration experiments, in which the companies were expected to somehow test a solution or concept which would combine their expertise. The role of Demos Helsinki was to facilitate the working.

3. *Experimentation:* The experimentation phase began after the Innovation Camp. During the time between January and October 2017 the partnering companies continued the projects by themselves and at their own pace. The facilitators from Demos Helsinki were in contact with the companies, and in some cases organised meetings to discuss the progress and plan the next steps. Of the three cases studied in this thesis, for two the practical experiment during this time was to formulate a mutual concept and begin selling it to potential customers. For one case the experiment centred around internal selling within the incumbent company.

4. *Scale-up Camp:* In October 2017 Demos Helsinki organised a follow-up workshop. The aim was to sum up the lessons learned from the experimentation phase, and either plan how the collaboration could continue or agree on finishing it.

The empirical cases to this research were selected from the companies which took part in the Bees and Trees project. The research for this thesis was started right after the innovation camp in January 2017 where four big corporations, the Trees, where collaborating with several startup companies, the Bees. After the innovation camp all Trees chose the most interesting

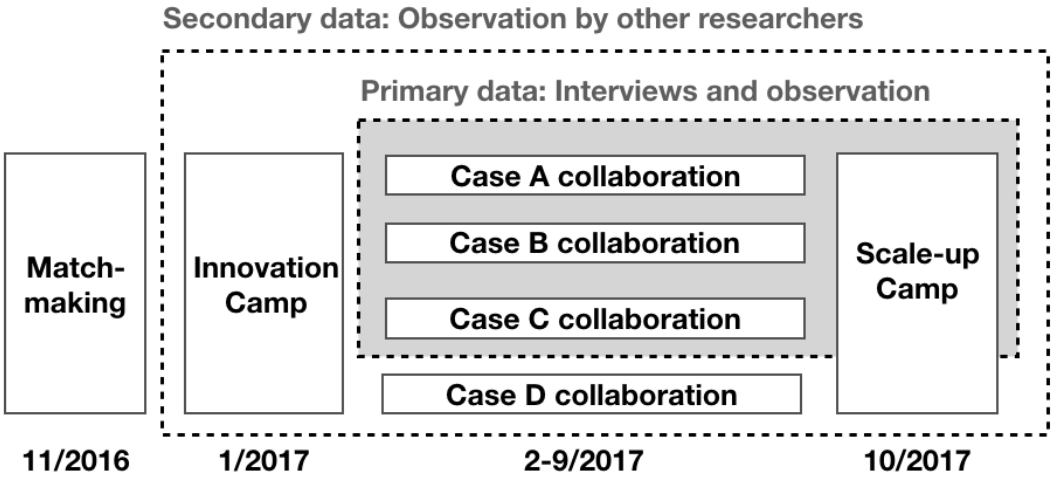

Figure 3.2: Project setting and data collection

startup with the help from Demos Helsinki to continue the collaboration with.

When narrowing down the topic of this thesis, three of the four cases were chosen for the analysis. The reason to leave one case out was that it would have been complicated to analyze using the same framework. The Bee in this case was a team in pre-startup phase with no clear intention to scale their solution. The solution was created in a hackathon organized by the incumbent company. For these reasons the basis for collaboration was quite different.

3.3.2 Company descriptions

The startups and large companies analyzed in this thesis are introduced in the following. The cases are named after the topics that the startups are working with to emphasize the thematic core of the collaboration experiments.

Case A: Food waste reduction

Tree A is a network of companies operating in retail and service sector. The network comprises of twenty independent regional cooperatives in Finland and the corporation which is owned by the cooperatives. The

cooperatives are owned by their members. The corporation operates as a central company, and provides the regional cooperatives with procurement, expert and support services. It is also responsible for the network's strategic guidance and the development of various chains. In 2016 the network employed 38 000 people. The Bees and Trees project in Tree A was run by the corporation's sustainability department. One of the four core themes in their sustainability work is climate change and circular economy, and in the project they wanted to concentrate on learning about advancing solutions in the field of consumer cleantech.

Bee A is a startup that aims to reduce the amount of food waste produced by restaurants, cafes and bakeries. With their mobile application consumers can buy food that would otherwise go to waste at reduced prices, typically 40-70 % discount, for example after lunch time. The service was launched in January 2016 in Helsinki, and since then it has expanded to 15 other cities in Finland. Over 200 restaurants in Finland are using the service. Internationally the startup has expanded to Sweden, Estonia, Germany, the Netherlands and Malaysia. The company reports that since the launching of the service over 350 000 leftover meals have been bought through the service. The amount of meals equals 90 000 kg of food saved from becoming waste. The startup has strong environmental values: will to reduce the amount of food waste and make more efficient use of resources. For restaurants the service offers extra profits, as well as brand value.

Case B: Smart heating

Tree B is a major residential development company in Northern Europe. They develop and sell housing units to consumers and investors, primarily in the form of multi-family houses. In addition to Finland, the company operates in Sweden, Germany, Denmark, Norway, St. Petersburg, Estonia and Latvia. In Finland the company focuses on biggest cities: Helsinki and the metropolitan area, Turku, Tampere and Oulu. As an important player in the housing market, Tree B wants to contribute to a sustainable urban development. The company's value chain consists of (1) land purchases, (2) project development, (3) marketing and sale, (4) project execution, and (5) customer service. In 2016 the company had approximately 1660 employees in eight countries. In Bees and Trees the company's motivation was to learn about working and co-creating new business with startups. They were also interested in finding smart housing solutions that would attract consumers.

Bee B is a startup with a smart-heating solution for buildings and district heating networks. By optimizing indoor heating, the service improves living or working conditions in buildings and lowers energy consumption by 10-35 %. The service is connected to district heating system and it enables demand-side management of energy use in selected buildings. The service works automatically at room level accuracy for commercial and residential buildings. The cloud-based service utilizes predictive algorithms and it is operated through wireless radiator thermostats. The company is founded in 2013 and it has three permanent employees. At the moment the startup operates in Finland, but it has raised interest in Europe and China.

Case C: Optimized use of buildings

Tree C is a major facility service management (FM) service provider in the Nordics specialized in workplace services, real estate services and strategic advisory services. Their customer base includes large and small organizations in both private and public sector. The company delivers a wide range of services in three segments: (1) workplace services (soft FM) include cleaning, office services, and staff restaurant operations, (2) property services (hard FM) include technical management of buildings, energy optimizations, damage control and repair, administrative and financial management and technical development projects, and (3) strategic advisory services include for example management support for customers that want to change their service operations. The company has also launched several smart services for example about archive digitization, remote meetings and drone inspection.

Bee C is a software development startup specialized in three main themes: feelings, real estate and energy. The company is interested in how people use and how they feel about spaces. The company has a service for tracking employees or customers feelings in real time and telling the topics and reasons behind the feelings. The service provides various benefits for employees, customer companies and real-estate management. From the employee perspective, the service helps companies to listen to their staff continuously. It can also help finding out which spaces are used inefficiently or turning in profit. For facility managers, the service can work as a real-time channel to communicate about needs for up keeping. The company is founded in 2014 and it has five employees.

3.4 Data collection

In case study research data collection techniques often vary and it is common to use them as combinations (Eriksson and Kovalainen, 2008). The methods of data collection for this research were interviews and observation notes of the participating companies as primary data, and observation notes by other researchers in the project as secondary data. Secondary data also included textual data about the case companies, such as company websites and annual reports. Figure 3.2 presented the primary and secondary data sources collected in different phases of the research project. This section describes how the different data collection methods were used in this research. Before moving to this, principles of data collection are presented.

This research follows the four principles of data collection suggested by Yin (2014) in order to devote to construct validity and reliability of the evidence. First, triangulation of data from multiple sources is especially important in case studies. The advantage of using multiple empirical sources of evidence is the development of converging lines of inquiry, which makes any findings or conclusions more convincing and accurate. In this study the requirement of data triangulation is fulfilled by combining interview data and participant observation both by the researcher and colleagues. Second, all case study data should be organized and documented in a database separate from the written report. To follow this principle, all the data of this research has been stored to a cloud database and a qualitative data analysis program Atlas.ti. The database includes audio recordings and written transcriptions of the interviews, observation diaries by the researcher and research colleagues, and personal notes made during data collection by the researcher. A third principle to be followed is to maintain a traceable chain of evidence from research questions to conclusions without the loss of original information due to carelessness or bias. The chain of evidence was aimed to be maintained during the whole thesis, but particularly the section describing the data collection and analysis will contribute to it. A fourth principle is to exercise care when using data from electronic sources. This requirement has been followed by cross-checking all the online material (for example about the case companies) with other sources to understand possible incompleteness or interpretative bias.

3.4.1 Primary data

The most important data source for the analysis is *semi-structured interviews*. The benefits of a semi-structured interview are that the materials are

somewhat systematic, as the themes covered in each interview are the same. However, the tone of the interviews is quite informal and conversational, and there is a possibility to ask additional secondary questions (Eriksson and Kovalainen, 2008). The interviewees were the representatives of the incumbent companies and startups participating in the Bees and Trees project and conducting collaboration experiments.

Interview process

The process of collecting the interview data started by contacting the relevant people in the case companies by email. As the focus of the study was the collaboration experiments conducted by the case companies, the most important criterion for the selection of the interviewees was their involvement in the project. In most of the companies the selection was clear, but in some cases several people were contacted to find the right person for the interview. One challenge was that the level of involvement in the project varied. This could have been overcome by conducting several interviews in the companies, but this was unfortunately not possible considering the limited resources for the research as well as the time constraints of some possible interviewees.

The table 3.2. shows the positions of the interviewees in the companies as well as dates and duration of the interviews. In the incumbent companies, Trees, the interviewees were from various positions, which somewhat affected the direction of the conversation in the interviews. This could be seen for example when discussing the role of sustainability in business. Even though one of the objectives of the whole research project was to analyze the development of sustainable innovations, the topic was more central in the interview of case A, where the project was led by the sustainability manager. In the startups, Bees, the positions of the interviewees were more similar. In two cases the project was led by the CEO of the company, and in one case, the region manager of Finland. The interviews were conducted between late June and early August 2017. The duration of the interviews varied between 55 minutes and 1 hour 15 minutes.

Permission to tape the interviews was requested and received in the beginning of all interviews. This allowed the researcher to fully concentrate on listening and being present the interview sessions. The interviewees were informed about the anonymity of the people and companies already in the request email. The decision to handle the cases anonymously was made, because it allowed more freedom for example to analyze the behaviour of

Case	Tree / Bee	Position	Date	Duration
A	Tree	Sustainability Manager	2.8.2017	55 min
	Bee	Region Manager	7.8.2017	1 h
B	Tree	Region Manager	16.7.2017	1 h
	Bee	CEO	26.6.2017	1 h
B	Tree	Business Unit Leader	26.6.2017	1 h 15 min
	Bee	CEO	27.6.2017	1 h 5 min

Table 3.2: Interviews for the case study

individual people in the collaboration experiments.

Interview structure

The interview questions were structured into five categories, which are described in this section. The specific interview questions can also be found in the Appendix. Because of the semi-structured nature of the interviews, all questions were not necessarily asked in the same order, and some questions were added or passed depending on the situation. The purpose of the interviews was to gain a deep understanding of the collaboration process so far from the companies' perspective, as well as to understand why and from what kind of conditions and environment the company took part in the project. Therefore, only some of the questions were raised from previous theories, and most were purely about describing concrete experiences.

In the first category, the interviewees were asked to describe their business environment, actors operating in the same industry, and trends and developments affecting their company and field. The startups were also asked to describe incumbent actors in their field. These questions were asked in order to gain understanding about the wide operating environment: regime characteristics and landscape pressures around the company. The startups were also asked what is the societal issue they are striving to solve and where they see themselves in five years time. These questions were asked in order to understand the specific niche and its development.

The second category of questions was about sustainability and innovation, and it was started by asking the interviewees to define sustainable business. The reasoning behind this was to set a starting point for the following questions and to be able to analyze the answers better. The incumbent companies were asked about their role in creating a more sustainable economy.

Startups were asked if they see their company primarily as a sustainable startup. These questions were asked in order to find out to which level the companies see themselves actively transforming their regime to more sustainable practices. Next, the interviewees were asked about external and internal drivers encouraging to sustainable innovations as well as obstacles hindering them. These were asked in order to gain understanding about the regime structures and lock-ins as well as positive developments.

The third category of questions was collaboration between startups and incumbent companies. The questions were about expectations of possible gains from collaboration and possible previous experiences. The startups were also asked what kind of change they would wish to achieve in the incumbent companies. The incumbent companies were asked if they saw a specific role of startups collaboration as a means to enhance sustainability. These questions were asked in order to position previous experiences and expectations in regards to Bees and Trees experiments.

The fourth category was about the collaboration experiments in the Bees and Trees project. First, the interviewees were asked to describe how the experiments had gone so far and how the situation was at the moment. Goals and motivation for the project were discussed next, as well as well as expectations of benefit for both themselves and the partner company. The interviewees were also asked about the main challenges and achievements of working with the experiment partner. Also, the role of Demos as an intermediary organization was discussed in this section. This category was the most important in regards to the analysis of the niche development processes and how the collaboration should be arranged.

The last category of questions was about looking at the future and wrapping up the discussion. The interviewees were asked what they thought would be a successful outcome of the experiment, and how they thought the collaboration would continue. They were also asked the most important things they have learnt during the collaboration experiments.

Observation

Additional primary data were collected by participant observation, which in this study means that the researcher was present and collecting notes in a workshop. According to Eriksson and Kovalainen (2008) participant observation is demanding, because the researcher needs to become accepted as part of the culture to make the observations natural. In this case, however, it was less of an issue since the researcher is part of the intermediary or-

ganization facilitating the collaboration of the companies. The observation workshop was the Scale-up Camp, where all the companies were reflecting on the collaboration projects and planning their future processes. This situation was described in the case introduction previously in this chapter. The observation was documented by writing notes during and right after the event.

3.4.2 Secondary data

Secondary data used in the study included observation reports and notes by research colleagues in the project. The observation notes were used in the study to ensure a sufficient level of data triangulation. Even though they were analyzed just as the primary data, the function was rather to strengthen the reliability of the primary data than to be used in the analysis as such. In addition, websites and annual reports of the case companies were used for writing the case descriptions. To ensure the anonymity of the case companies and people involved in the project, these sources of data have not been cited.

3.5 Data analysis

Interview material

The process of analyzing the data started with the transcription of the interview material. Each interview was transcribed right after recording the interview to avoid the burden of handling all material after the last interview. The transcribed interview files were imported into the qualitative data analysis program Atlas.ti. The program offers various tools to code and annotate findings in research materials. In this research Atlas.ti was only used for coding textual material, but it could also be used to analyze audio files, images or videos. According to (Eriksson and Kovalainen, 2008) coding means that the themes, features, instances or issues in empirical data are classified with a specific label. Yin (2014) distinguished between two main strategies of data analysis by coding.

Following an inductive strategy of analysis, the interview data were first poured through from the "ground up", without a pre-given theoretical framework. According to Yin (2014) this strategy is a good way to start an analytic path of analysis, as the data reveals first patterns or useful

concepts. This also means that the research questions are either formulated or at least refined and refocused as the process of the analysis proceeds (Eriksson and Kovalainen, 2008). An inductive strategy does not mean that concepts from prior theory could not be used in the analysis. Using sensitizing concepts means that theoretical concepts from prior research are used to help describing and analyzing the features of the empirical data and the meanings invested in them (Eriksson and Kovalainen, 2008).

The coding process began by conducting a test round for one interview. The codes that arose from the first interview where then searched from the next interviews, and new codes were created when the existing codes did not match some citations. After the "ground up" first-order coding the citations were roughly divided by thematic areas or second-order codes *Operating environment*, *Role of sustainability* and *Collaboration processes*. For example under the theme *Operating environment* the citations were labelled with the terms used in transition studies, such as landscape trends, regime path dependencies and windows of opportunity. In the citations under this theme the company interviewees described their industry and changes in it, barriers and opportunities for new innovations, and current trends.

The second thematic area, *Role of sustainability*, included citations for example about how the company saw its role in making the industry more sustainable, and what kind incentives and attitudes relate to it. During the research process and as the analytical framework found its final form, some of these citations were excluded from the analysis. The ones that were essential were either related to the themes of *Operative environment* or the *Collaboration process*.

At the phase of the research process where interview data were coded the final framework for analyzing the development of the collaboration experiments was not yet clear. After the choice to structure the framework based on the strategic niche management, the thematic area of *Collaboration processes* was revisited. New second-order codes were created according to the framework with the titles *Articulation of expectations*, *Building of networks* and *Learning processes*. These titles were used to roughly divide the first-order codes related to collaboration processes, but many of the citations were overlapping between different themes. The final coding of the whole interview material is presented in Table 3.3.

Finally, after choosing the citations which would be important for validating the analysis in the final text, the citations had to be translated from Finnish to English. The citations were translated with the aim to maintain the meanings and the style of speaking as well as possible. However,

something can always be lost in translation, and in the end, all translated citations are the researcher's interpretations.

Observation notes

After coding the interviews the observation notes from the Innovation Camp and the Scale-up Camp were coded by using the second order codes. This choice was made primarily because of limited resources for the study, but also because the function of the observation notes was to validate the primary interview material.

1st-order codes	Occurrence	2nd-order codes
Niche innovations in the field	6	**Operative environment**
Recent changes in the regime	12	
Pressure to change for incumbent	13	
Regulation-based barriers	14	
Regime lock-in or path dependencies	17	
Startup driving change in the field	17	
Window of opportunity for niche innovations	20	
Landscape trends	25	
Definition of sustainability	6	**Role of sustainability**
Sustainable innovations	8	
Business case for sustainability	17	
Attitudes	19	
Regulation-based incentives	21	
Company's role	21	
Solution easy to adopt	5	**Articulation of expectations**
Startup maturity	5	
New resources for innovation	7	
Prior experience	11	
Sustainability benefits	14	
Brand/PR value	14	
Expectations of the collaboration	15	
Possibility to create new business or get new customers	23	
Trust-building	5	**Building of networks**
Project management	8	
Co-creation	8	
Finding/involving a mutual client	10	
Successful roles and mandate/ champions	18	
Role of intermediary	30	
Challenges with roles or mandate	31	
Planning the experiment	6	**Learning processes**
Not enough planning	8	
New ideas	14	
Lack of resources	14	
Challenges with time frame or timing	17	
Learning from the collaboration	23	
Challenges with organizational structures or path dependencies	30	

Table 3.3: 1st-order and 2nd-order codes

4 Findings

In this chapter findings of the three case studies are analyzed according to the framework presented in Chapter 3. The sections are structured according to the dimensions of the framework: operating environment, shared expectations and goals, actors and network, and learning processes. In the last section, a cross-case analysis searches for similarities in the cases and summarises the findings.

4.1 Case A: Food waste reduction

Operating environment

Tree A is operating in the retail, food and restaurant sectors, which are largely driven by customer demands of a wide variety of options and continuous availability of products. The industry is facing major landscape pressures due to megatrends such as climate change and resource scarcity. Even though the majority of customers make their decisions based on price, the demand for sustainability and transparency is constantly increasing. Therefore, sustainability is not anymore about more efficient processes and reporting duty, but the priorities are now in offering more sustainable products and services to the customers and offering information about environmental impacts of consumption.

"If we think about sustainability issues, well they have become more and more emphasized in our customer feedback questionnaires and so on, and of course health and wellbeing themes can be seen a lot. For example for us these trends can now be clearly seen through the increase of sales in vegetables and organic food." - Tree A

Digitalization is another landscape level development, emphasized by Tree A, to shape the food and retail sectors widely. In digital services the company has already organized startup collaboration in the form of hackathons, and with some teams the work has continued as product co-development. Even though a big incumbent company such as Tree A is slow to change, and faces pressure from international actors in for example

e-commerce, they have a lot to gain from digitalisation, because of the vast amounts of customer and sales data.

According to Geels and Kemp (2007) from the niche innovators perspective the landscape developments pressuring the regime level are opening opportunities for new innovations to grow. In the case of Bee A the major trend is the growing interest of customers towards more sustainable consumption. Another development opening possibilities for solutions like Bee A's food-waste reducing mobile application is the increasing claim for easy everyday living.

"Well nowadays people make choices based on sustainability. So that's one topic on the user or customer side, they're beginning to think about what they eat, should they eat less meat and so on. We're an extremely sustainable choice for eating. And then people are quite busy and they kind of want to make their lives easier in every stage. So that's also what we want to offer, an easy way to eat dinner with our service. We want to make our users' lives easier." - Bee A

Even though Bee A's service has been taken to use by more than 200 restaurants in Finland and the business is growing fast, the company is facing some difficulties fitting to the restaurant field due to current structures and legislation. According to Bee A legislation such as the own-check system of foodstuff regulation hamper their business because nothing like their service existed when the legislation was set. Bee A has been advocating for changes in the legislation, but they are afraid that the process of changing legislation is too slow and it will only shift problems to another stage of the system.

"For example when you serve food in a buffet it can stay in the hot water for four hours, and it has to be sold during that time. In principle it cannot be cooled again. And then the health inspectors have different interpretations to it, and it makes it even more difficult for us. So the kind of uniformity and clearness of legislation would be for us like ... well, it is what burdens us at the moment." - Bee A

Articulation of expectations

For Tree A the main motivations to join the project were to learn from startups and to get new ideas concerning consumer cleantech, that could potentially be scaled through the incumbent's wide customer base. They

were not interested in investing in startups or buying them, but rather to act as middlemen for them. The startup took part in the project because they saw the potential of one incumbent actor with over two hundred restaurants, which could all begin to use their service to reduce food waste, so the motives were aligned quite well.

"We are a big actor, and not necessarily always that agile. From the startups we get new ideas, more agile ways to bring them further and then the kind of good spirit related to these [consumer cleantech] themes." [...] "And we see that we can provide the market place. So if we have small innovative companies who create these consumer cleantech products and services, we can then bring them together with our customer-owner and act there as a middleman." - Tree A

The startup also considered that an important motive for the incumbent was the sustainable brand value gained from collaborating with the startup, but this was not mentioned by the incumbent.

On a general level case A companies had a mutual vision about the importance of reducing the amount of food waste in the restaurant business. Bee A is a pioneering startup in the field aiming to scale their business internationally. Tree A recognizes its role as one of the biggest actors in Finnish restaurant and retail business, and their ability to help to reduce their customers' environmental footprint. The roles of a startup and an incumbent organization in sustainability transformation of an industry by Hockerts and Wüstenhagen (2010) are clearly seen in case A. Following the third stage of sustainability transformation, the startup is ambitious and aims to grow beyond the niche market, and the incumbent sees real market-potential in it. The quote by Bee A also highlights the ambitious attitude towards sustainability:

"We want to be an important actor reducing food waste and service waste in Europe. We have many plans how to scale our current actions... But let's say, if we talk about the 2030 goal in Europe to halve the amount of food waste, we want to be the actor which is then halving the amount considering service waste. An important actor, and well-known too." - Bee A

However, it quickly became evident that Bee A's solution could not be quickly scaled through Tree A. Bee A clearly articulated their business case and suitability for Tree A, but integrating it to the incumbent's internal

processes was stated to be challenging from the very beginning of the collaboration. Food-waste reduction was one of the key areas in Tree A's sustainability goals, and in restaurant business the process of systematising food waste reduction was under process. Bringing an innovation concerning food waste from the outside when the work concerning the same issue was ongoing proved to be difficult. This would indicate strategic misalignment (Bannerjee et al., 2016) of expectations towards the project in Tree A: the goal of reducing food waste in the restaurant business and the goal of advancing an external food waste related innovation did not match.

"... of course we see that their [Tree A's] food services or restaurants are able to significantly reduce their service waste. We have a solution to it even though they are optimizing it in the other end, in the production, all the time. We have a solution, kind of a safety valve, if they can't get everything sold. They will never be able to estimate it to zero, and then it's a lost customer or lost sales for them, when we practically are able to create new business compared to the current situation as well as reduce food waste." - Bee A

On the practical level the problem in the collaboration and experimentation according to the sustainability manager was that in the Tree A the project was not seen as a priority. The collaboration was started with too little preparation, so during the time span of the Bees and Trees project it did not rise high enough on the agenda. The expectations about the concreteness and timing of the project did not align since in the Tree A there were strong barriers to bring the project forward, but the startup was expecting concrete experimentation to happen sooner. Bee A also saw problems in the concrete short-term goal setting. Several meetings were arranged between various people from Tree A, but the meetings did not lead to any plans or follow-ups. From Tree A's viewpoint, the reluctance to set concrete goals was probably partly due to difficulties in mobilising the right actors, which will be discussed in the next section.

Building of networks

In the Tree A mobilizing the right actors inside the organization turned out to be difficult. The sustainability manager who was in charge of the project did not have enough resources or mandate to make decisions or gather up the right people for meetings. This resulted in situation where there was not enough sense of ownership of the project in Tree A. The top-level support was not enough to raise interest so that all relevant actors would have taken part. The quote below by Tree A indicates structural barriers in the organization hampering the collaboration process (Bannerjee et al., 2016), as the sustainability manager had difficulties to negotiate across different levels of the organization.

"Well for me personally [the most challenging has been] to gather up the right people internally and collect their views. It's just that people are busy and everyone has their own priorities so it can be a bit challenging." - "And like who guides and who commands, and who asks and who informs, you really have to think these through." - Tree A

In addition to the requirement of top-level support Tree A learned about the importance to consult and engage employees in the operational level. It might also have been due to insufficient time for planning, but before the innovation camp the needs and views about Bee A's food waste service had not been asked from the restaurant staff. According to the sustainability manager, the views of the restaurant staff should have been taken into account already when planning the collaboration. In the innovation camp, however, both companies concretely realized the importance of involving staff from the operational level in the planning of the collaboration. Even though the aim was to find out how to scale the startup's solution through the corporate level, it is vital for the top-level to understand the basics of how the solution concretely works in their restaurants.

"We could have struggled around some details much longer, but then this restaurant manager who had used our service happened to join the camp. To so many things that the top-level staff [of Tree A] weren't willing to believe, the restaurant manager could just say "no it doesn't work like that, we can easily do it like this". And then those things moved forward." - Bee A

Bee A noted that it was important to have the intermediary coordinat-

ing the project as a neutral expert. They felt that for Tree A it was much easier to trust ideas coming from the intermediary organization than from the startup. All three parties did not have an opportunity to sit at the same table after the innovation camp, even though it could have been effective. Due to the lack of own resources Tree A stated that it was important to have an intermediary organization scanning for possible startups and initiating the collaboration. However, the coordination and facilitation by the intermediary did not compensate the lack of internal planning in the incumbent company, which resulted in difficulties in for example finding the right people for the project. The quote by Bee A demonstrates the importance of an intermediary from the startup's perspective:

"It's like you don't really want to buy anything from a seller, but from an expert you will buy everything they sell. Here we are kind of in the seller's position, even though we're doing things together. When we try to suggest something, they [Tree A] have always this small filter there before the ideas get through." - Bee A

Learning processes

Technical learning about the niche innovation happened mostly in the discussions of the first Innovation Camp, as the top-level staff from Tree A familiarized with the solution. As described related to the network building, hearing experiences from restaurant staff about the solution was vital for the learning process.

In the process, both companies learned a lot about the essential preconditions for effective collaboration. In Tree A the most important learning was about who manages the collaboration and with what kind of possibilities to engage other people and make decisions. The sustainability manager found the collaboration project very important and therefore found it somewhat frustrating that mobilising commitment within the organization was so challenging. The quote below indicates that the collaboration project would have required a wider group of people involved or a person with a stronger mandate and allocated time.

"I learned the importance of planning, timing, internal conversations, resourcing, all of this... And that this kind of project can't be one man's or one woman's responsibility in an organization as big as ours. No way." - Tree A

From Bee A's point of view the main obstacles were the difference in the time-scale and the ability to experiment. For a startup, waiting for a year for a collaboration project to start can be financially impossible. They also believe that experimental culture in general would help big companies like Tree A to innovate, but the change is slow. The primary goal concerning the startup's service for food waste reduction was not to test its functionality in specific Tree A's restaurants but to learn how it could be scaled to all restaurants through the corporation level. Bee A had already achieved to get several individual restaurants to start using the service, and as the collaboration on the corporation level proceeded slowly, the startup continued to sell directly to the regional co-ops.

"One thing we sort of learned was that when we noticed that things didn't really go forward on the corporation level, we were able to make the decision to contact the regional co-ops directly. That we did not just leave it there. We kind of learned to go past the decision-making." - Bee A

In the Scale-up Camp the learning by Tree A resulted in drafting a process by which startup collaboration and sustainability goals could be combined. Through the discussions with Bee A and the intermediary organization the company recognised the need for appointing internal champions in every business area with whom the communications could be handled, as well as linking the startup collaboration to annual budgeting. Since only one person was responsible for the project and attended the Scale-up Camp, the learning process in the scale of the whole organization might have been quite weak. In Tree A second order learning could be achieved after the project if the sustainability manager achieves to communicate the lessons of the collaboration experiment and the new ideas about future collaboration. Analyzing this is, however, outside the scope of this thesis. From Bee A's perspective the learning process about how a large company functions was especially important, as the startup aims to start collaborating with larger companies internationally.

4.2 Case B: Smart heating

Operating environment

As a housing development company, Tree B is part of a wider regime of

construction and built environment. Urbanization and changes in consumer preferences are currently some of the biggest landscape trends the company needs to address. Responding to the trends and changes in consumer behaviour in the housing sector is quite slow because new buildings represent only a small minority of housing transactions compared to used apartments. Tree B recognised sustainability and the need to reduce emissions as major trends affecting the industry, but for a single company they are addressed mainly through regulation.

"... of course climate change and other green factors are [affecting us] in a sense, but then again it comes mainly through regulation, that there are certain energy performance requirements, and some heating systems are better than others and so on. So there's not really room for differentiation there, that one company particularly would make environmentally friendly apartments." - Tree B

The smart-heating startup Bee B's business is closely linked to both energy and built environment regimes. As the global energy production is transitioning from centralised to decentralised systems, demand for digital, service-based solutions is high. Regarding the construction industry, the landscape developments creating opportunities for startups like Bee B are digitalisation and demand for better quality of living. According to Bee B it can be seen, that companies in the construction business are more and more engaging in voluntary developing and finding of smart solutions that lengthen the life cycles of houses and make them better to live in.

Both companies note that the heavy regulation of construction of new buildings makes it quite difficult to experiment with niche innovations or to take them into use. The core market of Bee B's solution is existing buildings, where there is not that much regulation: the solution can be installed in existing buildings in the district heating system and in this sector the startup's business is growing. However, with new buildings the building regulations do not leave much room for adopting new innovations. According to Tree B bringing new technical solutions to customers is slow and expensive in the development of new housing. This is in contrast with the company's strategy to strengthen their market share in the segment of affordable housing.

"The industry is quite regulated in a sense that all apartments need to have certain things [...] so after that there's not that much room for inno-

vating. When you've done everything that's required, the price tag is quite high already. So if you want something on top of that, that people would find interesting, it's a market for Formula 1 drivers." - Tree B

Even though some obstacles towards startup collaboration and utilizing new innovations in housing and construction can be blamed on regulation, both companies also agree that to large extent the problem is organizational inertia and path dependencies in the incumbent companies. It is always easier and less risky to continue with business as usual than to try something new. As the construction industry in Finland is doing quite well and is not facing radical new regulation, there is no instant need for incumbent companies to change their course. As Bee B expresses it, if an incumbent company aggressively gets involved with something new, there is a real danger already.

"Well I think there is this normal [thinking] in all industries that what is new cannot work, by default. That's kind of the attitude. Let alone these industries such as energy and construction. In energy industry the planning cycle is about 50 years, and for buildings at least one hundred. So if you try to bring a model of rapid, experimental culture, there's a small disproportion. And it has been kind of heavy to prove against it, but I think we might have got over it." - Bee B

The region manager in Tree B considers that the biggest barriers for engaging in new ideas or innovations are the path dependencies of the organizations and people working there, even though the need to adopt new solutions for example concerning energy efficiency is well understood by people working in the industry.

Articulation of expectations

Tree B's motivation to take part in the project was to learn how to work with startups because they had acknowledged that finding innovative ways to develop their housing products from the inside is challenging. The company had some experience of working with startups, but no systematic processes for collaboration yet. They also wanted to build their own capabilities to differentiate from other building developers. Bee B's motivation was to find new partners with possibilities and will to distribute their service on a larger scale. Tree B's new building development was a more challenging field than existing buildings, but still an opportunity to create potentially beneficial

partnerships. In general, the startup's goal is to grow beyond the niche market to achieve bigger impact, which is shown in the quote below.

"Well all of these big things that we want to achieve are only possible if some bigger actors want to do it in mass production. We wish that we wouldn't have to sell or supply everything ourselves which goes through our company. But to make a product that someone else also wants to make and sell forward. And that's kind of... all the impact itself comes from there, but also the business side." - Bee B

On a general level case B companies both share a vision of creating better living environments and saving energy in buildings. Tree B wanted to try a smart, energy-saving solution, which would provide them with differentiation in a market where it is difficult to stand out. The startup Bee B is enthusiastic about being an active player in transition to sustainable energy use and at the same time strive to make people's lives easier with their smart-home solution. For Bee B's business it is crucial to collaborate with big companies in traditional fields, but for them it is important that the companies values match.

"Better energy and also achievements are created when collaborating with companies which somehow share the same values. In this field there are these "Chief Financing Officer types of people" who work with energy-efficiency because it gives you money, and the client buys it because it saves money. Working with them doesn't necessarily get you to the finish line. Then if we start to talk about building better living conditions for people, a bit more begins to happen. But if we start talking about building a cleantech revolution, then we can achieve the most." - Bee B

By the end of the project both companies agreed in the Scale-up Camp, that the timing was not right for more concrete collaboration. Tree B stated, that the startup's product could fit well in their strategy, but internal processes were not sufficient to bring the collaboration further. Here, expectations were aligned since the startup recognized both the lock-ins caused by building regulation as well as structural barriers in the incumbent company and therefore did not expect the collaboration to develop more easily.

Building of networks

In the Case B the initial trust-building between the companies started well, because in both companies the person leading the project was full of enthusiasm about the collaboration. The startup convinced the incumbent company with their solution's business potential and the ability to develop it jointly. Clear driving forces from the beginning of the project were both the region manager of Tree B and the CEO of Bee B. For the incumbent it was extremely important that the niche innovation and the team developing it were mature enough. In addition, both of the companies considered that the actor managing the network building and collaboration should be the startup because it is likely to have more to gain.

"Well [the biggest driver with Bee B has been] the CEO's way of working." [...] "They have this idea which it's not only like a great idea of a product which now requires a company around it, because they need it to sell the product. They have the product idea, but they are ready to develop it with customer's and create business out of it." - Tree B

Mobilizing action and resources within the incumbent organization was challenging because the project was not that high on the agenda. The project was important for the region manager who was responsible for it, but he also acknowledged, that the project was easily forgotten because of more urgent issues. The energy was difficult to maintain when the project was handed over to the operative level. The product development manager did not have the same enthusiasm towards the project, and according to Bee B this hampered the development.

"... then the region manager handed over to the next person, who hadn't been in the project from the beginning" [...] "well the project went on, but when it's a question of will and enthusiasm, these are always a bit challenging phases." [...] "The person who in the end concretely carries out the project should be motivated and involved from the very beginning. That's how you can make sure that everyone thinks it's the right direction to go." - Bee B

The CEO of Bee B also thought that the challenge to manage the project in Tree B was due to different positions in the company and mandate to make decisions. An unusual startup collaboration project with no proof of

succeeding might have been easier to manage by a top-level region manager than a product development manager. Thus, the region manager did not manage to provide the needed support and legitimacy for the project, which indicates structural barriers towards advancing the collaboration (Bannerjee et al., 2016).

The most important value of the intermediary organization was seen in the match-making, as well as in initiating the collaboration and facilitating the Innovation Camp in January 2017. However, both companies agreed that more active involvement could have enhanced the development of the project. Between the camps one meeting was arranged between the companies and a facilitator from the intermediary.

Learning processes

Tree B was interested in the startup's solution as one possible heating option for new apartments, but a concrete technical experiment was possible only during the heating season. However, by the end of conducting this study, the companies did not have a plan to concretely experiment the solution in Tree B's housing projects. In the Scale-up Camp the companies agreed that they have a common mission, but the timing for continuing the collaboration was not optimal.

Even though there was no concrete experiment with the startup's solution, both companies learned a lot from the collaboration process. The startup learnt about the needs and the operating environment of the incumbent. For the incumbent the main learning was about the differences in the time scale of the companies. To bring a startup's innovation to a new housing project would take several years, and for many startups that time is too long.

"... we had this working hypothesis that for example the time scale is very different. That if we would like to bring something new to the next housing project that we are planning, or to the future residents, the project would be ready then in 2,5 or 3 years. In that time the startup could have lived and died many times or their service might have changed a lot. If it were a technical solution or something else that we would bring to the apartments."
- Tree B

The business development manager was certain that the people involved in the project would learn about working with startups and bringing new

ideas to planning processes. The importance and value of learning had also come up in conversations in the company during the project.

"Whether it in practice works or not, the people working with this project will in any case learn kind of how to develop... I mean at the same time when we develop our processes and the planning management is a big part of it, that how we could it that stage bring some new input there. How can we develop it, and how can we learn to bring there the new ideas that we have observed or heard of. And also how do we learn to say no when it's the right thing to say. That if there is an obstacle, then we can continue next time if we now already can think of a way to overcome that obstacle in the future." - Tree B

In Tree B there were several people involved in different phases of the project, which might have slowed down the progress. However, learning from the project might have increased because it was not limited to one or two persons, and the communication seemed to work quite well. The project lead was unable to attend the Scale-up camp, so the building system manager and customer service manager of the company attended instead. Before the camp they learnt about the experiment from the project lead and the intermediary organization, thus during the camp they were able to continue analyzing the collaboration with Bee B. The learning did change some previous assumptions in the Scale-up Camp as the representatives of Tree B realized for example that changing the company culture would most probably first require lighter forms of startup collaboration, such as challenge competitions. The Tree B representatives started to plan a process of how to advance new collaboration processes including aspects such as clearer roles and responsibilities and clearer objectives for collaboration.

4.3 Case C: Optimized use of buildings

Operating environment

Tree C describes the facility management industry as very traditional and labour-intensive. The price competition between companies is intensive, but as the fifth biggest player in the field in Finland, the company wants to find competitive advantage from somewhere else. Digitalisation brings

huge opportunities to the field for example as service demand data will be gathered through sensors in spaces. In the company's premises in Sweden there is a sensor experiment going on, where for example recycling bins, projectors and windows are connected with sensors.

"Well it always sounds so grand, megatrends and cleaning [...] But it's a very labour-intensive industry, at least for the cleaning part, so for example if a customer pays us 100 euros then easily 70 or 80 euros is labour intensive work [...] Like at the moment we have people checking out if a meeting room is in shape, if a projector works, so even small steps in digitalisation can substantially increase our productivity, since the work is so labour-intensive." - Tree C

One recent development in the industry is tackled by Bee C with their emotion tracking and real-time feedback solution. For the facility management company this would mean better connection to customers and more efficient and demand-based services.

"More and more when you think of it, it's almost an amusing situation that even though people increasingly talk about real estates, the interest is turning to the people who use real estates. We have realized that it's quite an important knowledge that what people are doing in the real estates. Most of the actors actually don't know it". - Bee C

The companies did not recognize any barriers such as technical lock-ins or regulation that would hamper adopting new innovations to the facility management field. Instead, the problems arise mostly because of the path dependencies of individuals and organizations in a traditional field, an issue that was emphasized by both companies.

"This is quite a traditional industry and there are the certain ways how things are done. It surely requires some stimulation to start doing something new. [...] Everyone goes on with the old pattern, only maintaining and marginally developing it, so it requires external stimulation to make something new happen." - Tree C

Articulation of expectations

Tree C's main motivation to join the project was to find external re-

sources for new ideas and to develop their own capabilities to enhance innovation. In Sweden the company already has an open innovation ecosystem and experience of startup partnerships, but in Finland this was the first project about startup collaboration.

"In the recent years we have understood that we don't have the resources nor the know-how to find the best development ideas. That's why we aim to create an ecosystem where we have suppliers and various other actors, and where we can come up with the best development ideas by collaboration. In Finland we have even less resources, so we thought that with different partners we could find new ideas and maybe also bring some fresh thinking to this slightly ossified industry." - Tree C

The startup's main motivation was to increase sales through the facility management company, who already has a wide network of real estate owners and managers as customers. Both companies saw the value of collaboration as opposed to subcontracting. For Tree C collaboration meant learning from the startup and for Bee C it meant better possibilities to scale.

Bee C considered that one motivation for the incumbent was the PR (public relations) benefit from experimenting with a startup. The PR could also encourage the people working in the organization to consider the company as more innovative and possibly strive for it themselves. Tree C acknowledged that the collaboration has brought them good PR already. Only talking about the project and new ideas born during it has been beneficial for them.

"We have noticed, that this is surprisingly interesting [for our customers] [...] That the power of this regarding PR is surprisingly strong. Only kind of actively thinking about what kind of solution there could be, and then developing and bringing new ideas for our customers is interesting for us, because it profiles us differently than just selling the normal stuff." - Tree C

Expectations about the concrete experiment were quite well aligned from the beginning. The idea was to extend the startup's solution to work as a feedback and service tool for Tree C's facility management customers. Both of the companies agreed that the experiment should be conducted with a paying customer. An alternative could have been to test the solution for example in Tree C's own facilities, but it was not considered useful enough. Where expectations differed, however, was the time pace in which

the project went on. For the startup it was financially difficult to have too many meetings without any real progress.

Building of networks

In Tree C the collaboration was led by the CEO of the company, and because of this the top-level support for the project was quite well secured from the very beginning. The CEO was the one who initially got interested in the project, and with whom the startup managed to build trust. The CEO's of the startup and the incumbent were able to create trust and a mutual vision of collaboration already in the Innovation Camp.

"Well I think our CEO is the one [who has pushed the collaboration further]. He has been an entrepreneur himself, and he has been in various networks working with startups and he's been excited about it." - Tree C

However, the CEO himself was not the one to manage the project in practise, and communicating the overall targets was not totally successful. In the operational level several people were working with the project, but no one except the CEO had a clear mandate to bring it further or enough resources to work with it. The advancement of the collaboration was hampered by structural barriers in the company, especially problems in the communication between different hierarchical levels. The startup's CEO felt that they had to communicate between the people in Tree C, because otherwise the messages would not have gone through. This suggests, that involving too many people in the project without clear roles might only make the process more complicated.

"Well... we've faced some of these classic challenges of a big organization. For example internal communication within Tree C has clearly been challenging, and it has demanded... So we've clearly had this situation, how to explain it... There are many hierarchies, many managers, and then our project is tossed between different levels. The CEO makes some decisions, but he doesn't know everything that that's there behind, and other employees have no idea what the CEO has agreed. This kind of stuff. We have to do a lot of communications for them. Because of course we are able to manage all the information because we are a smaller company." - Bee C

The interviewed business unit leader of the Tree C did not see problems

in the management of the project, other than the lack of resources. Possibly the involved people did not see any problems in handling the project since they were more used to the hierarchies and rigid communications than the startup. Moreover, the business unit leader considered it to be the startup's responsibility to push the project forward and keep the incumbent informed.

Since the startup had already engaged in various kinds of collaboration projects with large companies, they did not have a strong need for intermediary organizations support. Third party view in some occasions was beneficial, but after the contact was initiated, the role was not considered important. From Tree C's perspective the most important role of the intermediary was the research about startups that could be possible partners for the company. After that the intermediary's role was not considered so important by the incumbent.

"In the beginning we got this rather wide list of all kinds of startups, and by no means could we had the possibility or resources to find them by ourselves." [...] "It was a big help that we were able to scan through that many startups." - Tree C

Learning processes

Concrete learning about the startup's solution combined with Tree's facility management services will most probably happen soon after the time of this thesis project as the companies start an experiment with a mutual client. However, the startup got some valuable new insight already from getting to know the industry and Tree's business. The startups business is to measure for example how people feel about different spaces, but from Tree C they learned about what different services have to do with it.

"For us maybe the most important lesson has been that we have deepened our understanding of what the services have to do with the space. That is Tree C's know-how, and for us it is very important to understand. We haven't learned it anywhere else. [...] For example how important a lobby is, we didn't know about it. [...] From Tree C's point of view the lobby is the hub, and if they don't operate in lobby, they can't take care of how they offer all the other services in that situation. When there's a complicated subcontracting chain in the background, the question rises that who takes care of the lobby and has the biggest influence, and make biggest business." - Bee C

During the project especially Tree C learned a learned a lot about collaborating with startups. Since it was the first project involving startup collaboration in Finland, they had not considered roles and resources for the collaboration that much in advance. During the project the company started to learn how much resources would be needed to make startup collaboration work.

"[A challenge has been] the time and resources something like this takes when we haven't done it that much before. We don't have any employees who could work with something like this whole-time, so it has been challenging to tear time from the part-time resources [...] Because to make it concrete it kind of requires a lot of work and that might have been the most challenging part." - Tree C

The lack of experience about working with startups in Tree C was felt by the partner startup as slow decision-making processes. In their opinion it took too long to achieve anything concrete. Moreover, the stigma of failure was considered by the startup as an issue that is hampering experimenting with new innovations in large companies.

"The problem is often the hierarchies of decision making. Even a small budgetary decision might require opinions from several people. So that's an obstacle. If the person in question has to talk to her boss, and the boss has to bring it to the executive board, then there are quite many turns [...] There is this experimenting mentality in Finland, that it's good to experiment and big companies talk about bringing in experimental culture. But there's still the issue, that if I experiment something in a big organization and it fails, the failure stigmatizes you. Like the way of thinking that you can try and fail without the stigma, there's a need for that." - Bee C

In the Scale-up Camp the representatives from Tree C were the CEO together with the company's contract manager. Since some of the first attempts to find a mutual customer had not succeeded, the project was shifted back to the CEO. In the camp the companies had a chance to plan in detail how the collaboration would continue. The lessons from the collaboration so far were used as a starting point for planning a more systematic process for having startups as innovation partners.

4.4 Summary and cross-case analysis

After the case-by-case analysis, this chapter summarises the key findings of the cases and searches for similar patterns. Direct comparison or generalisation of the cases would not be relevant nor possible, since the collaboration projects represent very different kinds of industries and companies. However, distinguishing similar challenges and opportunities in the cases may increase the understanding of collaboration processes for consumer cleantech innovations in different fields.

Operating environment

The operating environment around the case companies was examined to gain insight on the cases in the light of the multi-level perspective, before analyzing the collaboration processes. What all the three incumbent companies have in common are the landscape pressures of digitalisation and growing consumer demand for more sustainable use of resources. How actively the individual companies are reacting to these developments differs. Tree A is actively seeking ways to offer more sustainable products and services to customers, and especially food-waste is an issue that the company tries to tackle. Tree B is part of an industry which produces a major part of global CO_2 emissions, but since the industry is strongly regulated, the expectations for one company to actively become more sustainable are not that high. Tree C operates in an industry where concerns over sustainability are not that significant as such, but there is much potential for more efficient use of existing resources, which especially makes economic sense.

The niche innovations by the three startups could potentially help the incumbent companies react to landscape pressures. All the solutions either save resources or make more efficient use of current resources, and by doing so could be beneficial for the incumbents from both sustainability and economic perspectives. Even though Tree A is working on minimizing the amount of food waste in both restaurants and grocery stores, the impact of Bee A's solution could be significant since there are not many other solutions for radically reducing specifically service waste. The startup Bee B is tempting for Tree B, because the solution for heating optimization could be something interesting to offer to their customers. Due to its potential to significantly reduce energy use of housing, the solution would contribute to the sustainability transition of the built environment. Bee C could bring substantial benefit to facility management field by increasing its efficiency

and creating more business out of existing infrastructure.

None of the niche innovations are facing technical or regulation-based obstacles that would prevent them from scaling up in the current regimes of food distribution and built environment. Thus, they could be adopted as problem-solvers to the existing regimes, following the reconfiguration path by Geels (2011). The barriers at the industry level are largely about behavioral path dependencies of current actors in the fields and structural and cultural barriers in organizations. Especially incumbent actors operating in the built environment regime are quite traditional, which makes it challenging for startups to enter the field and create partnerships.

Articulation of expectations

FRAMEWORK	CASE A	CASE B	CASE C
What were the motives for the project and how did they align?	Incumbent: learning and finding scalable consumer cleantech business ideas Startup: the possibility to scale up effectively and sustainability impact	Incumbent: learning and building own capabilities to new product development Startup: the possibility to scale up effectively and sustainability impact	Incumbent: learning and building own capabilities to new product development, PR value Startup: the possibility to scale up effectively
How did expectations of the collaboration process align and develop?	Startup expected quicker progress, and more concrete goals, which were challenging for the incumbent	Expectations were aligned and both were content of the progress	Startup expected quicker progress, which was challenging for the incumbent

Table 4.1: Cross-case summary: Articulation of expectations

The motives for joining the collaboration project were quite similar within the Trees. All were looking forward to learning about working with startups and building capabilities to advancing new ideas and innovations, because of the understanding that new innovations are not often created inside the company (Chesbrough, 2003). All were interested in consumer cleantech solutions, but sustainability perspective was the most significant driver in Case A, in which the project was led by the sustainability manager. The startups joined the project because they saw an opportunity for scaling up by collaborating with incumbent companies with wide customer channels, which can be seen as complementary resources (Gans and Stern, 2003). In addition to the objectives of increasing the market share, the startups in cases A and B explicitly stated, that increasing the sustainability impact was a motivation for working with large companies. There were in-

terestingly some motives related to PR, which were identified only by the partnering company. All startups assumed, that that in addition to learning, the startup collaboration would provide good PR for the large companies, but Tree C was the only in incumbent to mention it. Similarly, the incumbents assumed that their good reputation would be an important motive for the startups to collaborate, but the startups themselves did not mention this as a motive.

On a general level the expectations about the collaboration between the actors in all cases were quite well aligned from the beginning, and the interviewed representatives seemed to be aware of what the partnering company was expecting from the collaboration. However, where the expectations differed was the pace of the collaboration and will to achieve concrete results. Especially in cases A and C the startups were expecting quicker responses and decisions, but in the incumbents the processes to advance the collaboration were slow. In the end, because of the narrow time span of the project, concrete experimentation was not achieved, so expectations of the innovation did not develop much. However, both SNM and alliance theory by Doz (1996) emphasize the importance of various experiments or various learning cycles. Thus, expectations did develop to a point where all companies saw possibilities to continue collaboration around the niche innovation in one way or another.

Building of networks

According to SNM the role of regime-level actors is perceived important in network building because of their ability to mobilize resources (Schot and Geels, 2008). However, in all incumbents there were some difficulties to achieve this. Various structural and cultural obstacles were found to hamper the internal network building in the incumbent companies. In Tree A the internal network did not develop since only one person was responsible for the project from the beginning, and she did not consider herself to have enough mandate to bring the collaboration further. In a large, hierarchical organization there were difficulties to find the relevant persons and gather them together. In Trees B and C there were many people involved in the project, as well as top-level support. In both cases the project lead was very supportive of the project but did not quite manage to shift the enthusiasm to operative level. Especially in Case C, the difficulties in internal communication of the incumbent hampered the collaboration from the startup's perspective.

FRAMEWORK	CASE A	CASE B	CASE C
How was the interest and action mobilized in the incumbent and was there top-level support?	Challenging because of structural and cultural barriers, not enough people involved Limited top-level support	Many people involved, but challenging to keep the interest up as the process was shifted from top-level to operational level Top-level support secured	Many people involved, but challenges in role-setting and internal communications. Top-level support secured
How did the communication and trust building develop between the companies?	Successful throughout the project according to both companies	First successful between startup and the project lead in incumbent Weak later with operational level from the incumbent involved	Successful between startup CEO and incumbent CEO Communication very difficult because unclear roles in incumbent
How did the intermediary organization enhance the collaboration process?	For incumbent the help in startup scanning most important Important for the startup as neutral third-party, could have been helpful in negotiations	Most important role in match-making phase and Innovation camp More active role in experimentation phase could have enhanced the collaboration	For incumbent the help in startup scanning most important Not considered important by the startup

Table 4.2: Cross-case summary: Building of networks

In all cases the initial trust-building between the leading persons from the startup and incumbent went smoothly since all had high motivation for the project. As more people became involved in the projects, the communication turned out to be more challenging. In order to achieve a functioning partnership between the companies, especially the startups stated that the direct contact person in the incumbent should be one with real interest to manage the project. However, all incumbent companies seemed to be very satisfied with how the startups managed the project. It was stated by most of the companies that the main driver in the collaboration between a startup and incumbent should be the startup because they probably have more win. The different approaches of startups and incumbents towards radical innovation were also clearly seen in the cases. In accordance with the finding by Weissbrod and Bocken (2017), experimental capabilities were quite difficult to find in the incumbents, regardless of the need for learning. The startups, on the other hand, were willing to adapt quickly and find ways to experiment and were also active in the network building.

The role of the intermediary organization in the network was considered quite important. Following the classification by Batouk (2015) the incum-

bents emphasized the connecting function and the startups the facilitation function. Trees A and C both stated that they would not have had the resources or the contacts to find possible startups to try collaboration with. Some more check-ups or common meetings with the intermediary would possibly have enhanced the progress of the project, but all incumbents agreed that in the end it was the responsibility of the collaborating companies. The role of an intermediary as a facilitating middleman in the workshops and meetings was considered important by startups in situations where the power balance was somehow unequal. Bee A considered that more active involvement of the intermediary could have been useful since the incumbent was more likely to trust a third party than a startup. Bee C also mentioned the importance of this role in situations in which the trust between the parties is not fully achieved.

Learning processes

FRAMEWORK	**CASE A**	**CASE B**	**CASE C**
What did the companies concretely learn about the niche innovation?	How the solution works and how it could be applicable for incumbents environment	How the solution works and how it could be applicable for incumbents environment	How the solution works and how it could be applicable for incumbents environment
What did the companies learn about collaboration?	Incumbent: internal selling, process and skills needed in collaboration, difference in time scale Startup: environment and processes of the incumbent	Incumbent: process and skills needed in collaboration, difference in time scale Startup: environment and the needs of the incumbent	Incumbent: process and skills needed in collaboration, difference in time scale Startup: processes of the incumbent
Did the learning change assumptions or behaviour of the companies and how?	Process ongoing, not enough data to analyze	Process ongoing, not enough data to analyze	Process ongoing, not enough data to analyze

Table 4.3: Cross-case summary: Learning processes

Quite similar learning processes were found in all cases. Technical learning about the niche innovations happened mainly at the first Innovation Camp, where there were thorough discussions between the potential partners. Even though in later stages there was not so much technical learning, at the beginning of the process it certainly had a role in the partner choices of the incumbents.

The learning processes were, however, much more centred around the different organizations' ways of working. The learning in dimensions of environment, process, skills and goals (Doz, 1996) were all mentioned in the

interviews. Interesting was that within the incumbent companies, most of the learning seemed to focus on internal factors. In Tree A this meant the importance of internal selling and the challenges to mobilize action and commitment. Trees B and C learnt about the importance of internal processes for collaboration and the resources and skills needed. All incumbents also emphasized learning about the time scale difference between startups and incumbents. This was mostly due to organizational inertia of large companies, but especially in case B also wider regime structures: residential development projects might be quite challenging for startups, who might not be able to wait for several years for a project to be ready. This learning was also valuable for Bee B, for which a project with a company developing new buildings was a new area.

In the Scale-up Camp the companies got an opportunity to discuss the experiences and learn also from other partnerships in the project. A facilitated event for reflection was found beneficial, and it served as a starting point for all companies to design more systematic collaboration processes. This could be regarded as second-order learning, even though evaluating was found to be impossible within the project's time span.

It can be concluded that for being able to scale up niche innovations by collaborating with regime-level actors, learning about the different ways of working is essential. Enough time should be allocated for the network building and learning about the partners before expecting any concrete experimentation.

5 Discussion and conclusions

The last chapter concludes the research by discussing the key findings and theoretical contributions of the study in the main section. The following sections discuss the managerial implication, limitations of the study, and finally suggestions for further research around the topic.

5.1 Key findings

The primary motivation for this research derived from the notions that there are more and more startups in Finland and globally which strive to address sustainability issues such as food waste or energy consumption while at the same time having a clear business case (Demos Helsinki, 2014), but these startups could benefit from partnering with incumbent companies with more resources. At the same time incumbent companies in traditional fields such as food distribution and built environment are facing increasing pressures to adopt more sustainable practices (Loorbach, 2007). The innovations around which this research – especially the empirical part – centres, were defined as consumer cleantech: "*products and services which save natural resources by creating new, more flexible, cheaper, and better forms of living*" (Ritola et al., 2015).

In the beginning of this thesis three objectives were defined to guide the processes of studying collaboration between incumbent companies and startups in the field of consumer cleantech.

1. To map different theories in the areas of transition studies, sustainable entrepreneurship, and strategic collaboration.

2. To identify a justified approach for studying collaboration experiments between incumbent companies and startups in the field of consumer cleantech.

3. To explore collaboration experiments in real-life situations and identify challenges and opportunities in them.

A qualitative, inductive approach was considered to be the best suitable for analyzing the contemporary phenomenon. The approach gives an opportunity to remain adaptive, and even reformulate the research design and research question as the work proceeds (Saunders et al., 2009). Moreover,

as the research was conducted at the time that the collaboration processes between the case companies were going on, it was important to revisit the design and research question through the course of the research. The research process led to the formation of the final research question: *How can incumbent companies and startups collaborate with the aim to enhance consumer cleantech innovations?*

To address the first two objectives of the study an extensive literature review was conducted. The main theoretical contribution of this research was the attempt to combine several areas of literature that so far have been seldom been combined. The theoretical starting point for the research was found in studies on socio-technical transitions, a growing field of research interested in fundamental and long-term changes of established sectors such as energy, transportation or food toward more sustainable modes of production and consumption (Markard et al., 2012). In transition studies the framework of strategic niche management (SNM) has been used to analyze how niche innovations develop and break through to the regime level, and either replace or complement existing technologies. The theory assumes, that regimes are resistant to change and develop incrementally along established pathways, thus radically innovative niches require projection and incubation in order to develop. According to SNM niches develop through three dimensions: expectations are articulated and become more concrete, networks become broad and mobilize action, and learning happens in various domains (Raven, 2005). The selection environment of regime and landscape level either facilitates or hampers the development (Schot and Geels, 2008).

As transition studies mainly analyze long-term developments and broad range of actors with a systemic approach, the connection to specific actors, especially companies, has been understudied. Moreover, even though the importance of studying interactions and linkages between niche and regime levels in general has been acknowledged, the connection to companies operating on these levels and engaging in collaboration has previously not been made. For this purpose, the perspectives of startups and incumbents on sustainability-related innovations were added from the field of sustainable entrepreneurship. Various similarities were found in the processes of niche building in SNM and the development of strategic collaboration between businesses. For example, both theories address the need of aligning expectations, and learning in various dimensions in order to strengthen possibilities of success for an innovation or collaboration process. While SNM literature – as also transition studies in general – concentrates on various actors, which enable a niche to develop, insight from strategic collaboration shifts the focus of analysis to processes within and between specific companies.

To propose one way of systematically connecting these streams of literatures, the SNM framework was extended with insights from the fields of sustainable entrepreneurship and strategic collaboration. The result was an analytical framework for analyzing processes in which startups and incumbents collaborate in order to advance consumer cleantech innovations and learn from each other's ways of working. An empirical multiple-case study was conducted to reach the third research objective. Three cases, which consisted of a startup and an incumbent company conducting a collaboration experiment, were analyzed based on interviews with company representatives and workshop observation. Direct comparisons of the cases could not be done since the case companies present different industries, but several similarities can be addressed.

First, even though transition perspective proved to be quite challenging to apply to individual companies and specific projects, the core elements of the multi-level perspective were identified in all cases. The incumbent companies addressed similar landscape pressures affecting their business environment, and realized that niche innovation by startups could help them to reactively address these pressures. In transition terms these would be characterized as windows of opportunity. Following the four the transition pathways presented in Chapter 2, the cases could be characterised as being on reconfiguration pathway. According to Geels (2011) in this pathway *"...niche-innovations are more developed when landscape developments exert pressure on regimes. If niches are symbiotic to the regime, incumbent actors can adopt them as 'add-ons' to solve local problems."* Also, characteristics of startups and incumbents in sustainable innovations by Hockerts and Wüstenhagen (2010) were clear in the cases: the startups had a strong value base and transformative vision, and the incumbents with more resources wanted to be fast followers in order to stay competitive.

Second, the expectations in general were quite well aligned and articulated in regards to understanding the partner's motivations and the potential of mutual benefit. However, in more concrete terms the startups were expecting more experimentation and faster progress, while the incumbents were quite satisfied in slowly getting to know each other's ways of working. In line with the findings of Weissbrod and Bocken (2017), the corporate mindset and various organizational barriers dominated in the incumbent companies strongly despite the experimental approach of the project.

Third, concerning the network building dimension, mobilizing action and interest internally within the incumbent companies was a challenge in all cases. However, the network building between the startups and certain incumbent actors with the help of the intermediary organization was quite

successful. Studies on collaboration barriers (e.g. Bannerjee et al., 2016) back these findings, but they could also benefit the SNM literature. The resources and capabilities of incumbents that could possibly benefit the development of niche innovations can be largely dependent on individual person's capabilities of driving the innovation projects forward.

Fourth, the most important learning dimension identified was the learning about the partnering companies and ways to collaborate. Before being able to concretely experiment with mutual clients, especially the incumbents needed the time for getting to know the startup's ways of working and addressing the internal barriers. Also the startups learnt about the structures in the incumbent industries which affected the collaboration. This finding is something which could be useful for SNM. When building heterogeneous networks, enough time should be allocated for learning about the collaborating actors before expecting concrete experimentation around the niche innovation.

All in all, the perspective of transition studies was chosen as a background for this study because it provides a systemic and holistic viewpoint to sustainability-related innovations and companies actions against the changing landscape. Both startups as niche innovators and incumbent companies as regime-actors have an important role in bringing sustainability transitions further. This thesis only managed to scrape the surface of the concrete ways these actors can collaborate, and further research is needed.

5.2 Managerial implications

Setting aside the theoretical approach of socio-technical transitions, the case studies provide concrete lessons and guidelines for startup–incumbent collaboration processes. Even though lessons learned have been discussed throughout the fourth and fifth chapter, some should still be emphasized. Practical guidelines for companies will also be published as a report in the spring 2018 as a part of the Bees and trees project.

There are various ways for large companies to engage in collaboration with startups and other types of small companies or innovators. The large companies studied in this thesis were all quite new to the idea of startup collaboration, which is why the learning had to start from basics. In the beginning of Bees and trees project there were a large number of startups involved and most of them were not quite ready for working with the large companies. However, those that finally were chosen for the collaboration were already more mature and experienced. Thus, the following lessons

are directed towards large companies planning the start collaborating with startups.

1. Set clear objectives for collaboration and communicate them

Objectives for a large company to engage in startup collaboration can be various. For a strategic collaboration to succeed the objective should be aligned with the strategy and processes that support it. The objective can also be lighter, such as enhancing entrepreneurial mindset in the corporation, but this should also be clear for the partnering startup.

2. Appoint a startup champion and secure top-level support

A responsible person with entrepreneurial mindset and allocated resources, often referred to as a startup champion, is essential for a successful collaboration. A startup champion makes sure that communication flows within the corporation and builds trust with the startup. Top-level support for startup collaboration makes it much easier to mobilise action and resources and succeed it collaboration.

3. Experiment, learn and repeat

The most important ability a large company can learn from a startup is the ability to experiment. This should also be applied to the collaboration process itself. The first collaboration project will most probably fail in one way or another, but the lessons learned will provide a basis for the next experimentation.

Finally, as the case studies implicated, collaboration with startups should be considered not as only means to adapt to changes, but as means to proactively renew the business of an incumbent company. As sustainability is increasingly considered to have strategic value, partnerships with startups developing sustainability-related innovations can provide a significant opportunity.

5.3 Limitations

Several limitations of this study need to be addressed. The literature review covers a wide variety of topics from different scholarly fields, but it does not include all related aspects that could be valuable for studying the topic. Some aspects and theories have been excluded intentionally, but some have inevitably also been missed unintentionally. The reason for this is the limited

time and resources for a Master's thesis. The topic of this thesis concerns a novel phenomenon, and most of the theories reviewed are also quite recent. Consequently, some terms and definitions are still under debate, which leaves room for misunderstanding or misinterpretation.

There are also several drawbacks to the empirical data and analysis. Due to limited resources the main source of data was interviews of only one person in each company, even though several would have been involved in the collaboration project. Also to analyze the collaboration processes thoroughly, interviews on several occasions or more frequent and in-depth observation would have been beneficial.

Finally, some limitations are due to the methodological choices of the thesis. The interpretive philosophy means that the researcher views the reality subjectively, thus another researcher could potentially make different interpretations of the same data. However, the interviewees' opinions were aimed to be reflected as correctly as possible.

5.4 Suggestions for further research

The limitations of this study provide a fruitful starting point for suggesting some topics for further research around the topic. As the study was designed to explore previously unfamiliar research areas but had limited resources, many aspects could not be covered very deeply.

Theoretically, this was the first attempt to combine SNM framework to strategic collaboration between businesses. As the need for niche-regime alliances in sustainability transitions is addressed, further studies combining the topic to theories of alliance development would be an important contribution. Empirically, studies on strategic collaboration from SNM perspective should cover longer time periods than what was possible in this thesis. Moreover, the perspectives of specific companies and their actions in the light of socio-technical transitions still require further research. As this thesis suggested, experiences from various fields such as sustainable entrepreneurship and radical innovation provide lessons of firm-level behaviour.

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A Interview questions

A.1 Questions for incumbents

1. Please introduce yourself and describe your role in the project

COMPANY & BUSINESS ENVIRONMENT

2. Could you briefly describe your business and your industry at the moment?
3. What are the most important changes or trends affecting your business environment? At the moment / In the long rung
4. What kind of key actors are changing your business environment?
5. How does your industry react to startups in the field? Are they seen as competitors or possible partners?

SUSTAINABILITY & INNOVATION

6. How would you define sustainability or sustainable business?
7. How do you see the role and opportunities of your company in creating a more sustainable economy? How do you concretely enhance sustainability?
8. How does sustainability show in your innovations and development?
9. In your opinion, what should be the next big step towards more sustainable business?
10. What external drivers encourage you to create or promote sustainable solutions? Market based / Regulation based
11. What might be the main obstacles that hinder the diffusion of sustainable solutions? External / Internal

COLLABORATION WITH STARTUPS

12. Why do you want to collaborate with startups? What might be the benefits and added value that you are looking for?
13. What kind of startup collaboration have you engaged in? Example of a successful collaboration project?
14. Can you give any examples, when is startup collaboration difficult or impossible?
15. Could startup collaboration help to make your business more sustainable? How?

BEES AND TREES PROJECT

16. How has the collaboration project with startup X proceeded?
17. What is your company's main motivation and goal in the B&T project?

18. Does the collaboration with startup X relate to your sustainability goals or initiatives? How?
19. Who or what has been the driving force in the experiment?
20. What kind of added value or benefits do you expect to gain during the experiment?
21. What kind of added value or benefits do you expect to offer startup X in the experiment?
22. So far about experimenting with startup X, what has been the biggest challenge / achievement?
23. What has worked well and what could be improved in the following stages of collaboration: Matchmaking / Innovation camp / Experiment
24. How has the communication worked with company X?
25. How do you see the role of Demos in the collaboration and experiment?

OUTCOME

26. In your opinion, what makes an experiment successful?
27. How do you expect the B&T collaboration to continue after the experiment? Do you already have plans available for continuation?
28. What is so far the most important learning for the next experiment and the collaboration?
29. How do you see your personal role in developing the collaboration during the experiment? Is there anything that you would do differently, if the collaboration and the experiment would start now?
30. Is there anything else you would like to add or comment?

A.2 Questions for startups

1. Please introduce yourself and describe your role in the project

COMPANY & BUSINESS ENVIRONMENT

2. Could you briefly describe your business and the industry where you are operating at the moment?
3. How would you describe the incumbent companies in the field?
4. What are the most important changes or trends affecting your business environment? At the moment / In the long rung
5. How do you see your market position in 5 years?
6. Which societal challenge or problem is your business striving to solve?

SUSTAINABILITY & INNOVATION

7. How would you define sustainability or sustainable business?
8. Do you see your company as a sustainable startup? In what ways?
9. What external drivers encourage you to create or promote sustainable solutions? Market based / Regulation based
10. What might be the main external obstacles that hinder the diffusion of sustainable solutions?
11. How about internal drivers and obstacles in your company?

COLLABORATION WITH BIG COMPANIES

12. Have you collaborated with big companies before? Example of a successful collaboration project?
13. What do you want to achieve from collaboration with big companies?
14. What changes do you want to achieve in big companies through collaboration?
15. What kind of companies you would not want to collaborate with? Any experience or examples of unsuccessful collaboration?

BEES AND TREES PROJECT

16. Why did you choose to take part in the project?
17. What is your company's main goal in the project?
18. Who or what has been the driving force in the experiment?
19. What kind of added value or benefit do you expect to gain during the experiment?
20. What kind of added value or benefit do you expect to offer company X in the experiment?

21. So far about experimenting with company X, what has been the biggest challenge / achievement?
22. What has worked well and what could be improved in the following stages of collaboration: Matchmaking / Innovation camp / Experiment
23. How has the communication worked with company X?
24. How do you see the role of Demos in the collaboration and experiment?

OUTCOME

25. In your opinion, what makes an experiment and collaboration successful?
26. How do you expect the collaboration to continue after the experiment? Do you already have plans available for continuation?
27. What is so far the most important learning for the next experiment and the collaboration?
28. Is there anything that you would do differently, if the collaboration and the experiment would start now?
29. Is there anything else you would like to add?